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# AMERICAN GAS ASSOCIATION MONTHLY

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Refueling the Graf at Los Angeles

By C. E. HOULGATE

1929 A. G. A. Convention Opens October 14

House Cooling—What Shall We Do?

By THOMSON KING

Marking Holders As Aviation Landmarks

By WALTER D. THURBER

Research Will Show the Way

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Sampling Products of Combustion from  
Gas Appliances

By F. E. VANDAVEER

Gas—An Industry Second to None

By BERNARD J. MULLANEY

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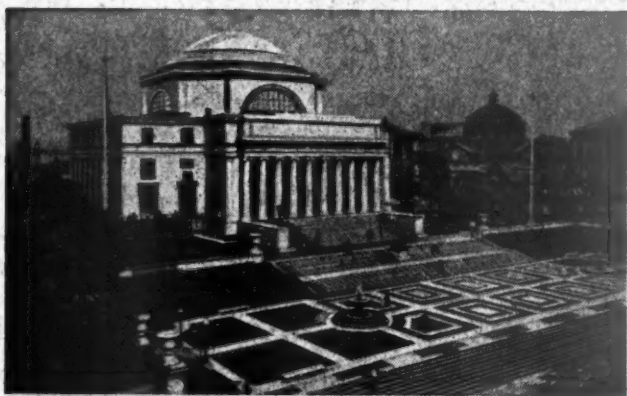
*October, 1929*



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Volume XI  
Number 10

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## YOUR OPPORTUNITY?

Would you be interested in acquiring a better technical knowledge of the essentials of the gas industry; the processes of making coal gas, carburetted water gas, and oil gas; how these gases are prepared for commercial use, their storage and distribution; their use in domestic and industrial appliances; the chemical control of a gas plant; how to avoid accidents in the operation of a gas plant, and the principles of accounting, statistics, rate making, and public relations?

If so, you should enroll in the Home Study Course in Manufactured Gas offered by Columbia University under the auspices of the American

Gas Association, a course which includes information and instruction on all the above phases of gas company operation—and more—all under the personal supervision of Professor Jerome J. Morgan of the Columbia University faculty.

A special rate of \$60 for this course is available to individual members and employees of member companies of the American Gas Association.

Complete information and application blanks can be secured from the Home Study Department, Columbia University, New York, N. Y., or the American Gas Association, 420 Lexington Avenue, New York, N. Y.

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# AMERICAN GAS ASSOCIATION MONTHLY

Howard F. Weeks, Editor

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Volume XI

OCTOBER, 1929

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October  
14-18  
Atlantic City,  
N. J.

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## Our Own Who's Who



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### WILLIAM J. WELSH

**H**AS been associated with the gas industry on Staten Island since boyhood. After long service in the production, distribution, and sales department of the company, he was elected President of the New York and Richmond Gas Company in 1912, and has since continued in that capacity.

Mr. Welsh is President of the Staten Island Savings Bank, President of the Empire State Gas and Electric Association, Treasurer of the Society of Gas Lighting, and Treasurer of the New York State Committee on Public Utility Information. He has served on two of the Committees of the American Gas Association during the past year, and has been nominated for the office of treasurer of the Association for 1929-1930.

# AMERICAN GAS ASSOCIATION MONTHLY

VOLUME XI

OCTOBER, 1929

NUMBER 10

## 1929 A. G. A. Convention Opens October 14 at Atlantic City, N. J.

**R**AILROAD tickets have been purchased . . . and every detail arranged for the 1929 convention of the American Gas Association, to be held in the Municipal Auditorium at Atlantic City, N. J., from October 14 to 18.

More than six thousand gas men are expected to attend this most important convention of the gas industry. Delegates from every nook and cranny of the United States and Canada will be there, and there will also be a representative attendance of gas men from across the ocean.

The program of the convention will be essentially as tentatively announced in the September issue of the A. G. A. MONTHLY.

There will be an additional address at the Tuesday morning general session on "What the Laboratory Is Doing for the Industry," by R. B. Harper, of Chicago, Ill. The general sessions will be featured by speakers of nation-wide reputation—and their subjects will be of paramount importance to the public utility industry. The section and department meetings in the afternoon have been arranged to eliminate the holding of parallel sessions, in so far as possible, and enable the delegates to devote ample time to the large



*The Atlantic City Auditorium*

exhibition of appliances and equipment.

### The Exhibition

This year the exhibition will occupy more space than ever before. There will also be more manufacturers exhibiting than at any previous exhibition. From

present indications there will be many

new appliances and pieces of equipment on display. There will be several important exhibits on coke, cooking, etc., as well as the comprehensive showing of the American Gas Association services.

### One Address to be Telephoned Across the Atlantic

A convention address delivered in England will be heard by 6000 gas men through the trans-oceanic telephone.

This is the first time that the trans-oceanic telephone has been used to transmit an address from England during a public utility convention.

The message will be given by Sir David Milne-Watson, managing director of the Gas Light and Coke Company of London, England. The message will be amplified throughout the convention hall.

### Speakers at General Sessions



*H. N. Davis*



*W. C. Beckjord*



*James J. Davis*



*G. E. Vincent*



*Laura M. Cauble*



*Samuel Insull, Jr.*



*G. E. Whitwell*



*O. H. Fogg*



*A. W. Robertson*



*R. B. Harper*



*Sir David  
Milne-Watson*



*Alexander Forward*

#### Session to be Broadcast

This year the American Gas Association convention "goes on the air." Through the cooperation of the National Broadcasting Company, part of the meeting of the eleventh annual convention on Wednesday evening, October 16, will be broadcast. Parts of the program will also go out over Station WPG.

The program to go on the air consists of

entertainment, music, and some brief remarks. Charles Hackett, tenor, will render several solos, and B. A. Rolfe's orchestra will play.

#### Entertainment

Entertainment features of more than usual attractiveness have been arranged. All members are requested to consult their convention

programs immediately upon arrival. B. A. Rolfe's orchestra will play for all entertainment functions, and certainly no one will question the statement that this is one of the world's finest orchestras.

#### Natural Gas Department

Samuel W. Meals, chairman of the Natural Gas Department, has announced a very important convention session for the natural gas men on Tuesday, Oct. 15. There will be several addresses on subjects of interest, and open discussion on subjects which come up for consideration.

#### Accounting Section

The Accounting Section will meet on Wednesday and Thursday afternoons, Oct. 16 and 17. The program for these sessions is an exceptionally good one, and no accountant will want to miss the opportunity of being present.

#### Commercial Section

This Section will have its convention sessions on Tuesday and Wednesday afternoons, Oct. 15 and 16. Every phase of commercial activity will be covered in the addresses, and it is quite apparent that the commercial men will take great interest in this 1929 meeting.

#### Manufacturers Section

The manufacturers of the industry will convene for their convention session on Monday morning, Oct. 14. There will be one address on the very significant subject of standardization.

#### THE SOLOIST

Charles Hackett, famous American tenor, will be the soloist at the evening meeting of the annual American Gas Association convention in Atlantic City, N. J.

All radio listeners have heard Mr. Hackett. Undoubtedly his artistry will add much to the evening's entertainment.



#### Technical Section

The Technical Section will hold three meetings at the convention, starting at three o'clock on Oct. 15, 16, and 17. An interesting array of addresses and committee reports will feature these meetings. Subjects of interest to all technical men in both branches of the industry, manufactured and natural, will be covered.

#### Publicity and Advertising Section

This Section will hold one meeting, on Wednesday afternoon, Oct. 16. The program has been arranged to consist only of subjects of practical value to the advertising and publicity men in the industry.

#### Industrial Gas Section

This Section will have most interesting convention sessions on Wednesday and Thursday afternoons, Oct. 16 and 17. Leaders in the promotion of gas as a fuel for industry, as well as experts from outside the industry will address these sessions.



*B. A. Rolfe and his world-famed orchestra*

## Officers of the American Gas Association



*Treasurer*  
Clifford E. Paige



*President* Oscar H. Fogg



*Vice-president*  
B. J. Mullaney



*S. W. Meals,*  
*Chairman,*  
*Natural Gas*



*H. L. Whitelaw,*  
*Chairman,*  
*Manufacturers*



*Managing Director*  
*Alexander Forward*



*E. F. Gardiner,*  
*Chairman,*  
*Pub. and Advt.*



*F. H. Patterson,*  
*Chairman,*  
*Accounting*



*H. E. Bates,*  
*Chairman,*  
*Technical*



*G. M. Karshner,*  
*Chairman,*  
*Commercial*



*J. P. Leinroth,*  
*Chairman,*  
*Industrial*





*The Atlantic City Auditorium at night*

#### Women's Meeting

At a special meeting of the women of the industry, to be held Monday afternoon, Oct. 14, the following addresses will be given:

Opening Remarks, by Miss Clara H. Zilleon, Philadelphia Suburban Counties Gas and Electric Co., Philadelphia, Pa.

The A. G. A. Testing Laboratory—Geo. B. Shawn, A. G. A. Testing Laboratory, Cleveland, Ohio.

Cooperation of Industries—Miss Mary I. Barber, The Kellogg Company, Battle Creek, Mich.

Women in the A. G. A.—Miss Mary Spear, American Gas Association.

Home Service—Miss Jessie McQueen, home service counsellor, American Gas Association.

#### Home Service

A special Round Table gathering for home service workers will be held on Thursday afternoon, Oct. 17, at 2:30 o'clock.

#### General

The members are requested to consult their official convention programs for all convention details. Programs, of course, will be distributed at the registration desk in the Municipal Auditorium in Atlantic City.

The registration fee for members will be the same as it has been in the past—\$2. Registration for non-members will be \$3. Register early and avoid the rush.

#### Advance Paper Distribution at the Convention

Printed committee reports and papers will be distributed at the convention as follows:

*General Committee Reports*—These will be distributed in envelopes at the Registration Bureau when registering.

*Accounting Section Reports*—These printed committee reports and papers will be distributed at the Accounting Sessions at which the report or paper will be presented.

*Commercial Section Reports*—The reports of this Section will be distributed at the convention session at which the particular subject is presented.

*Industrial Gas Section Reports*—The reports and papers of this Section will be distributed at the convention sessions at which the report or paper is presented.

*Technical Section Reports*—These reports and papers will be distributed at the sessions at which the particular report is presented.

This convention distribution of papers and reports will supplement the distribution that was made by mail on August 25 and September 18.

A blank for ordering copies of reports not received by members will be included in the envelope containing the general committee reports distributed at the Registration Bureau in Atlantic City.

### Calendar

The following is the complete calendar of activities for convention week:

#### Monday Morning, Oct. 14

- 9:30 o'clock—Exhibition opens.  
10:30 o'clock—Manufacturer's Section meeting.

#### Monday Afternoon, Oct. 14

- 2:30 o'clock—Women's meeting.  
5:00 o'clock—Executive Board meeting.

#### Tuesday Morning, Oct. 15

- 10:00 o'clock—General Session.

#### Tuesday Afternoon, Oct. 15

- 2:00 o'clock—Natural Gas Department meeting.  
2:30 o'clock—Commercial Section meeting.  
3:00 o'clock—Technical Section meeting.

There will be no meetings of the Publicity and Advertising Section, the Industrial Gas Section, or the Accounting Section.

#### Tuesday Evening, Oct. 15

- 8:30 o'clock—Dance in ballroom of Municipal Auditorium.

#### Wednesday Morning, Oct. 16

- 10:00 o'clock—General Session.

#### Wednesday Noon, Oct. 16

- 1:00 o'clock—Ladies' lunch and card party.

#### Wednesday Afternoon, Oct. 16

- 2:00 o'clock—Publicity and Advertising Section meeting.  
2:30 o'clock—Commercial Section meeting.  
2:00 o'clock—Industrial Gas Section Meeting.  
2:00 o'clock—Accounting Section meeting.  
3:00 o'clock—Technical Section meeting.

There will be no meeting of the Natural Gas Department on this afternoon.

#### Wednesday Evening, Oct. 16

- 8:00 o'clock—Evening meeting—Hon. James J. Davis, Secretary of Labor, speaker. Medal and Prize awards. Charles Hackett, tenor, and B. A. Rolfe's orchestra. Parts of this meeting are to be broadcast.

#### Thursday Morning, Oct. 17

- 10:00 o'clock—General Session.

#### Thursday Afternoon, Oct. 17

- 2:00 o'clock—Accounting Section meeting.  
2:00 o'clock—Industrial Gas Section meeting.  
2:30 o'clock—Home Service Round Table.  
3:00 o'clock—Technical Section meeting.

There will be no meetings of the Publicity and Advertising Section, the Commercial Section, or the Natural Gas Department on this afternoon.

#### Thursday Evening, Oct. 17

- 8:30 o'clock—Gala night—fancy dress dance.

### New Booklet on Public Service Is Available

"PUBLIC SERVICE" is the title of an interesting pamphlet of some 36 pages recently published by the American Educational Press, of New York, N. Y.

This pamphlet is compiled and edited by Irving Jay Rogers, the editor of "Achievement," a recent book. The contributors to "Public Service" are George B. Cortelyou, Thomas N. McCarter, Roger W. Babson, M. S. Sloan, E. M. Herr, and Prof. Irving M. Fisher. The introduction is written by William Butterworth, President of the Chamber of Commerce of the United States.

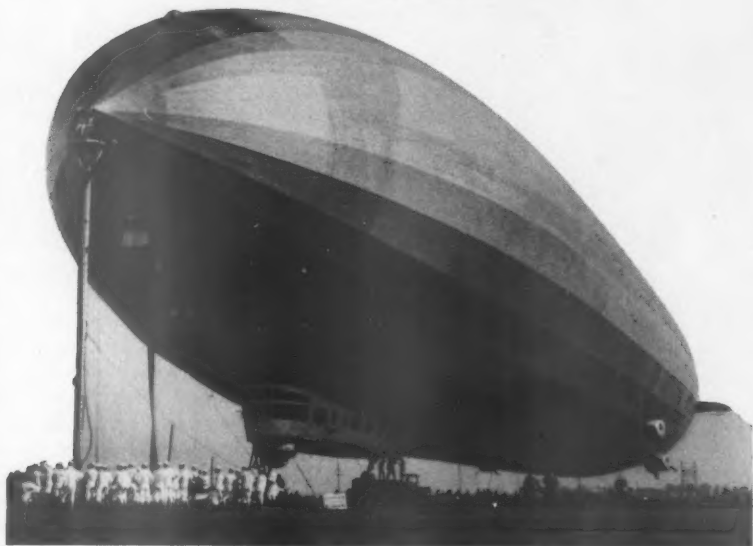
Copies of this interesting booklet are being mailed to member companies of the American Gas Association by the A. G. A. Additional copies can be secured from the American Educational Press, 25 West 43rd street, New York, N. Y. Price is twenty-five cents a copy.

### Visitors at the A. G. A.

AMONG the visitors at A. G. A. Headquarters recently were Y. Mishima, engineer of the Tsurumi Works of the Tokyo Gas Co., Ltd., Tokyo, Japan, and Masutaro Ikeda, executive director of the Toho Gas Co., Nagoya, Japan.

## Refueling the Graf at Los Angeles

By C. E. HOULGATE



*The Graf Zeppelin is being refueled at Los Angeles on its trip around the world*

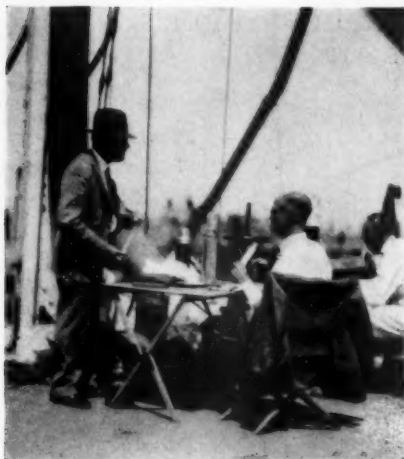
WHEN the Graf Zeppelin, D-LZ-127, departed from Lakehurst, N. J., on its now-famous trip around the world, preliminary details for its refueling in Tokio, Japan, and in Los Angeles, Calif., had already been completed. In its Los Angeles refueling, the part played by the Southern California Gas Company should be of considerable interest to the entire gas industry, for this utility successfully accomplished the first natural gas fueling of a dirigible in the history of lighter-than-air craft.

With the mooring of the big ship at Mines Field, Los Angeles' Municipal Airport, on the morning of August 26, and after the passengers had disembarked, refueling operations were immediately started. In this process, the gas used for the motor fuel was a mixture of Pyrofax and natural gas, which was regulated at a double orifice set-up at the edge of the field in the approximate proportion of 36 per cent natural gas and 64 per cent Pyrofax.

Mr. Houlgate is connected with The Southern California Gas Co., Los Angeles, Calif.

Pyrofax, a trade name for a combination of two per cent butane and 98 per cent propane, similar in nature to a product of "rock" gas, has a specific gravity of 1.57 at normal temperature and at a pressure slightly above atmospheric temperature.

The natural gas furnished for the refueling by the Southern California Gas Company was taken from the Athens-Rosecrans oil field and sent directly, a distance of eight or ten miles, through the company's mains along the Inglewood-Redondo Highway to Mines Field. There a connection to the company's orifice meter and regulator set-up permitted its measurement and regulation. From there it was carried a few feet further to a connection at one end of a manifold. The other end of the manifold connected with the line that carried the Pyrofax from tank cars standing on the A. T. & S. F. tracks that parallel the east side of the field. At the junction of these two gases in the manifold and in the thousand feet of eight-inch pipe that carried it



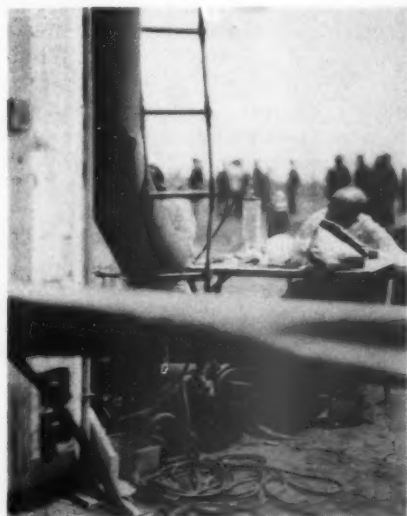
*J. F. Murray and H. A. Hurley are conferring on specific gravity readings*

to the foot of the mooring mast, the natural and Pyrofax gases were mixed, forming the fuel gas. This mixture, which gave the fuel a specific gravity closely approximating 1.05, or that of air, was carefully checked at the mooring mast with a Schillings bottle operated by the effusion method, gravity readings being taken at intervals of every five minutes. After testing for specific gravity, the fuel, at a few inches of water pressure, was carried up the side of the stub mast and into the nose of the Graf through an eight-inch rubberized canvas tube. The rate of the fuel's flow was approximately 16,000 cu.ft. an hour, with the amount taken on estimated at 181,000 cu.ft. The refueling required slightly less than 12 hours.

While much larger than any dirigible ever built, the Graf differs little in design from any of its predecessors. Its length measures 235 meters, or 771 feet, and it has a maximum diameter of 30.5 meters, or 100 feet. The fundamental idea as to the design may be briefly summarized with the following: Polygons, or so-called rings, consisting of light-metallattice girders stiffened with radial wires, are united by means of girders of a similar style of construction running in the longitudinal direction of the

ship to form one complete skeleton in stream-line shape. These rings, of which there are 16 in all, are built up at intervals of 15 meters or 49 ft. 3 in., and limits the boundaries of the individual compartments in which the "gas bags" for storing the lifting and fuel gases are placed. The entire 30 tons of duralumin frame work, including the tail, rudder, and elevators at the stern, is covered with a cotton envelope woven expressly for the purpose, specially prepared and treated, and extremely strong. This envelope is varnished with several coats to reduce the air resistance and treated with aluminum powder to lessen the heating and radiating influence of the sun.

Five Maybac motors of 550 hp. each comprise the power units of the Graf. These motors, which are capable of developing a traveling speed of 117 km., or 73 miles, per hour, are fitted in five individual gondolas—called power cars—which are hung on the outside of the ship, two each at different levels on both sides of the ship and the fifth below and at the rear near the tail. The Maybacs are designed to run from 1,000 to 2,000 hours without any major repairs, are directly reversible, and weigh 1,200



*At the foot of the mooring mast—the line going up carries fuel gas—the horizontal line carries hydrogen*



*Left: The company's orifice meter and regulator set-up at Mines Field. Center: Manifold and mixing point for the Pyrofax and natural gases. In the rear is a pre-heater. Right: The 1000 foot eight-inch pipe line laid to the foot of the mooring mast*

lbs. They are reached from the main gondola via a "cat walk" inside the Graf and by metal ladders connecting surface doors with the "cars." At all times during a flight, or when temporarily moored on a trip, an engineer is stationed in each "car." Communication from the control room to the power car is made by machine telegraph.

The fuel used in the Maybags consists of liquid or dry gas, although the dry gas must have a specific gravity of 1.05 and a B.t.u. value in the vicinity of 2000.

Ballast water is produced very rapidly by using the exhaust heat to condense water from the atmosphere. Storage of water recovered is arranged so as to distribute its weight evenly. The ship also has about a 5000 U. S. gallon storage capacity for gasoline, but where or how stored is one of the phases of its construction those in charge of the Graf are reluctant to reveal. At Los Angeles, a request for 400 gal. of gasoline was met with a supply of 600, but most of this was soon dumped overboard in order to trim the ship. Gasoline is used in the Maybags as an emergency fuel, each motor being equipped with dual carburetors that permit an instant switch from gas to gasoline. Gasoline is rarely used except in taking the Graf off the ground or in gaining altitude suddenly, such as would be necessary in crossing a mountain ridge or range. In this eventuality, through the use of gasoline, the load of fuel is rapidly lightened and the ship rises.

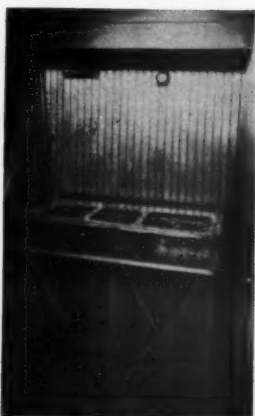
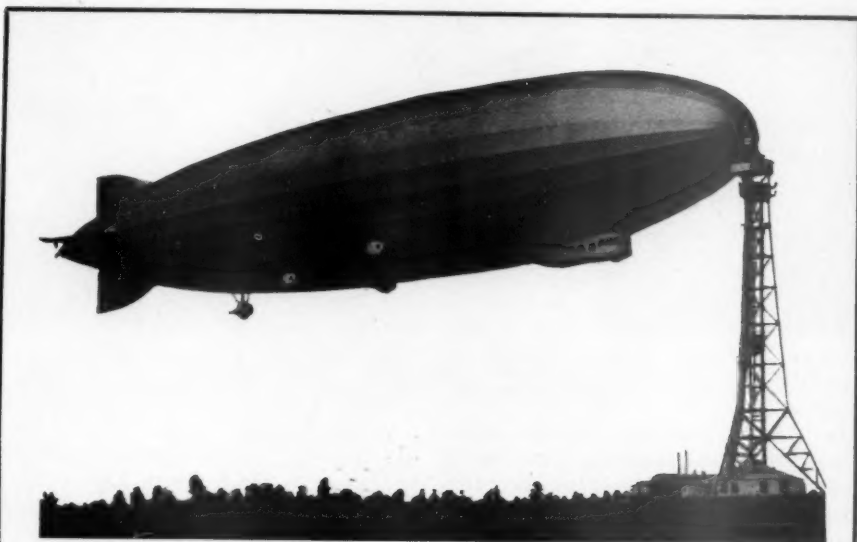
The fuel ballonettes are suspended from the lower half of the ship in the same arrangement as the hydrogen bags, but are only 10 or 12 in number. Their capacity varies around the 900 M cu.ft. mark at atmospheric pressure. Since the fuel gas is mixed so as to give it a specific gravity equal to that of air, use of the fuel in no way affects the weight of the ship, for as soon as the gas in one ballonette is emptied it is filled with air, keeping the weight constant. Both the lifting and fuel gas bags are manifolded, each being under separate control.

### Many Out-of-Towners Visit Gas Exhibition

**W**ILLIAM E. SAFFERY, who has charge of the permanent exhibit of modern gas equipment of the Consolidated Gas Co. of New York in the Architects Sample Building, has recently stated "that in addition to attracting a great many architects, the display attracts many out-of-town people."

"During one afternoon recently," Mr. Saffery said, "two residents of Australia, two of Detroit, and one of Vancouver visited the display and learned of the latest gas appliances. There have been visitors from Tennessee, most of the Southern States, and there was one from Waco, Texas."

Mr. Saffery estimated that fully 25 per cent of those who visit the permanent exhibit are from territories not served by the Consolidated Gas Co. of New York. He explained that in every case the same attention and the same courtesies are extended to these out-of-town visitors.



#### LOS ANGELES USES GAS RANGE

**A**S announced in the September issue of the A.G.A. MONTHLY, the United States Airship Los Angeles uses a gas range for cooking. Now, through the courtesy of P. M. Wood, of the Protane Walray Corp., New Rochelle, N. Y., we are privileged to show illustrations of the gas range and also of the containers used to store the gas fuel.



#### Holder at Glens Falls, N. Y., Is Now An Aviation Landmark

**A** NEW airway marker at Glens Falls, N. Y., has been announced by Major G. F. Heustis when he said that the New York Power and Light Corporation had completed the painting of a large white arrow, indicating the direction of the Glens Falls airport, on top of its 200,000 cu.ft. holder.

The gas holder was recently painted beige, a shade which has been adopted as the company's standard for this purpose. The white arrow on the roof, indicating the direction of the Floyd Bennett field, is 68 feet long with a shaft four feet wide, the words "Glens Falls Airport" appearing in letters seven feet high with a width of one foot. These markings are easily read at an altitude of 2,500 feet and under good flying conditions can be discerned at altitudes approaching 10,000 feet.



## Marking Holders As Aviation Landmarks

By WALTER D. THURBER

FEW structures lend themselves more admirably to the installation of local airway markers than do the gas holders, the warehouse and compressor station roofs controlled by the gas industry.

An appreciation of this self-evident fact is indicated in a nation-wide survey of gas industry properties adaptable for airway signs recently undertaken by a committee on "Aids to Aviation," headed by Samuel Insull, Jr., under the auspices of the American Gas Association. A recent communication from this committee is to the effect that returns received from about 30 per cent of the companies, representing 498 holders, show that more than 100 now carry airway markings for daylight flying, of which seven are illuminated at night.

A. Gordon King, secretary of the A. G. A. Committee, writes us that many companies which have not yet installed airway markers report that they are ready to do so as soon as definite recommendations are available.

There are a number of reasons why the gas industry should actively interest itself in the installation of airway markings on properties so eminently fitted for that purpose. Some of the reasons may be summarized as follows:

1. While the development of aviation in this country is almost entirely a matter of private enterprise, there is little doubt that every manufacturer and owner of airplanes immediately would turn them over to the country in the event of war. Thus, private



*Airway signs on a holder of the Los Angeles Gas & Electric Corporation*

enterprise, without government subsidy, is creating a powerful offensive and defensive weapon ready for the nation's service when and if needed. To encourage aviation, then, is a patriotic duty.

2. The installation of any suitable airway marker is a distinct service to the community in which such a marker is placed. National and regional prominence, through designation on airway maps, aerial photographic news services, aviation magazines, etc., is given those communi-

ties properly marked for modern air travel. The individual, firm or corporation which installs a local marker creates additional good will for himself or itself and at the same time is recognized among those progressive local influences which are looked up to as leaders in the development of the home community along thoroughly modern lines.

3. Conversely, to control properties so pre-eminently suitable for airways markers and to permit them to continue unused for this purpose is to miss an opportunity for a national and local public service which will be gratefully appreciated now but which in the near future will be demanded by modern communities anxious to obtain the many advantages which accrue from adequate designation on the rapidly increasing network of air roads.

4. The cost of appropriate air markers is so small in comparison with its value that this need not be considered as a deterring factor. When the Southern Counties Gas Company, about a year ago, began seriously to consider the installation of a number of airway markings on its properties from Santa Barbara to

Mr. Thurber is advertising and publicity manager for the Southern Counties Gas Co., Los Angeles, Calif. Presented at the recent annual convention of the Pacific Coast Gas Association, Del Monte, Calif.

Newport Beach, it met with immediate appreciation generously expressed by local Chambers of Commerce, city officials, service clubs, and others awake to the advantage which would accrue to the community through installation of the proposed markers. We found that the Aeronautics Branch of the U. S. Department of Commerce had issued a bulletin in April, 1928, with suggestions for the painting or installation of airway signs. Briefly these suggestions covered the following points:

1. A simple block letter in chrome yellow on a dull black background to be used. When painted on a roof with a slope of more than 30 degrees, the sign to be painted on both sides of the roof.

2. Letters should be 12 feet in height if possible and not less than six feet high.

3. Width of letters such as "M" and "W" should be equal to two-thirds their height, and other letters in proportion.

4. A spacing of at least one-fourth the height should be used between letters.

5. In addition to the name of the town, the sign should include an arrow, large enough for easy visibility from the air. The arrow should point due North and with the letter "N" under or over the arrow shaft. This directional arrow is highly important since it enables the air pilot to orient himself and determine his direction accurately.

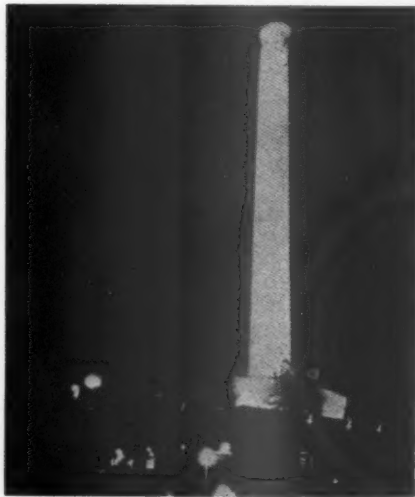
In the spring of the present year our company completed eleven of these airway signs. The total cost of these eleven signs including paint, labor, transportation, and incidentals was \$596.45, or less than \$55 per sign. The length of the signs ranges from 60 feet to 102 feet and the height of the letters ranges from nine feet to 16 feet, depending upon the space available. In almost every instance we followed the suggestions from the U. S. Department of Commerce to the letter. Our engineers, however, raised the question of the visibility of the chrome yellow letters as specified, when used on the aluminum finish of our high-pressure holders. We decided to experiment in a few cases and in these we used a black letter on the aluminum finish. The comparative visibility of these two colors with the light

background was tested from the air and we found, as we expected, that black on the white background was, beyond question, more desirable.

Further experiments are to be conducted by Southern Counties Gas Company in cooperation with the Department. As a part of the experiment we shall cover the top of our low-pressure holder at Venice with aluminum paint, and on this background the airway marker will be lettered in black. Tests of visibility from various altitudes will then be made in government planes. The results of these experiments will be available upon request. The opinion has been advanced that the chrome yellow, originally suggested by the Department of Commerce, may be practicable in the east or middle west where the average number of hours of sunshine per day or years is much less than on the Pacific Coast. It is entirely probable that in other sections of the country, yellow exposed to limited sunshine will not fade so rapidly.

Other company members of the P. C. G. A. manifest a desire to cooperate with the organized gas industry in developing recommendations which may be advanced either by the P. C. G. A., or the Insull Committee

(Continued on page 638)



## House Cooling—What Shall We Do?

The home of the  
future—will gas  
cool it?



BY THOMSON KING

WE are confronted today with many important and interesting problems, but to most of these we know the answer in whole or in part. To the question I am about to consider, I do not believe anyone yet knows whether the answer is yes or no. Yet it is exceedingly important that we should soon know the truth and promptly act upon it.

This riddle, the answer to which will so vitally influence the future of our industry, may be stated in its simplest form as follows:

**Is the Cooling of Houses and Buildings by Gas Refrigeration Commercially Practical and Economically Sound?**

The progress already made by gas refrigeration in small units and the opinions of men who are most familiar with the practical aspects of refrigeration and air conditioning are already such as to indicate that there is a very strong probability that commercial refrigeration and space cooling by gas is economically sound in principle and does not present technical difficulties that are insurmountable. I believe the time has come for intensive research to determine whether this probability can be made a reality.

Let us look into some of the implications that would result from an affirmative an-

swer. The demand for cooling and conditioning of air is already here and is being met in theatres and other buildings. There seems little doubt that there is a potential demand for the cooling and conditioning of air for residences and smaller buildings in many parts of the country. It also follows that if gas is the best source of energy for the cooling of houses, it is also best for many other medium sized applications of refrigeration: Stores, meat markets, restaurants, storage rooms, and innumerable other places where cooling and air conditioning are needed.

If the future is to see the cooling of homes in summer, and there seems little or no doubt that it will, our question resolves itself into one—whether gas, electricity, or oil can best serve this need; does such a load belong to gas or to electricity? If gas cannot compete with electricity for this load, we should know it and turn our energies in other directions. If, on the other hand, gas is more economical and better adapted to handling the work, we should be bending every energy toward developing the necessary technical knowledge and the proper appliances and promoting the idea that this business belongs to gas.

The desirability and great importance of such a load as gas refrigeration affords is so obvious as to need little comment, but the fact that on account of its heating business

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*The success of the gas refrigerator is well established—why not take the step to house cooling by gas?*

the gas industry needs the refrigeration load more than the electric central station does not seem to have had the attention it deserves.

The more progressive manufactured gas companies have secured the domestic cooking and water heating loads of their communities to such an extent that no very large increase in sendout may be looked for in the near future along these lines. They have cautiously entered the field of central gas-fired house heating and a few companies have gas heating units on one per cent of their meters. A very few under exceptionally favorable conditions, such as exist in Portland, Ore., have exceeded this percentage. We now know what rates and what sales effort are necessary to sell one per cent of our customers under given conditions; we do not yet know accurately the rate and sales effort necessary to sell the second per cent and still less the third or fourth per cent. We can make a shrewd guess, however, because heating has been sold for 13 years, the appliances have been perfected, and the costs relative to other fuels are well known.

We can calculate that if a city has 20,000 meters with an average annual consumption of 40,000 cu.ft. per year, that with a given rate and sales effort in a given time, they can sell heating to one per cent of these

meters and secure 200 heating jobs using, say an average of 400,000 cu.ft. each per year or, 80,000 M cu.ft. altogether, making an increase of ten per cent. But this ten per cent increase will all be used in seven months of the year and 40 per cent of it may be used in January and February. Hence, the caution in taking heating. It is evident that the great problem is to find a compensating load which will fall largely in summer.

The industry has turned to summer water heating in large buildings and some companies have made special summer rates, but the amount of true summer business appearing has been rather disappointing.

The gas-operated domestic refrigerator has appeared and is making progress, but its consumption is so small that it holds little hope of producing an effective balance for the heating load. So the problem remains! We know people are turning to automatic heat. If we do not sell them, the oil men will. We can get big increases with heating. The load factor on a maximum hour basis is good—on a maximum day basis, not so good. We must have a summer load!

If we can develop equipment to cool houses and handle small and medium sized commercial refrigeration, we will secure a load that will have ideal characteristics for balancing our heating and that will be of sufficient volume to have a real effect on the company's load factor. Best of all, it will be used through existing meters and services in most cases, without increase of customer or fixed charges. The value and desirability of such a load can hardly be exaggerated. It is valuable in itself and it will permit us safely to take on more of the available heating load. It is obvious that we must find out as quickly as possible if its acquisition is a real possibility or a false hope.

The attack on the problem naturally divides into three parts. *First*, research and study to determine the cost of refrigeration effect obtained by gas in plants of varying size, and a comparison of this cost with

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## Hot Water Sales and Hot Weather Ran Together in this Sales Campaign

By J. CHARLES JORDAN

**S**UCCESSFUL selling of hot water through the use of automatic gas water heaters in the "good old summer time" when old Sol was running the temperature up around 100° or better in the sun-kissed valleys of California is further evidence that this type of business is not seasonal.

The campaign conducted this summer by the Pacific Gas and Electric Company again demonstrated that an aggressive sales effort, supported by concentrated advertising and a trained sales crew backed by a cooperating force of employees, will be successful.

Early in June the preliminary plans for the campaign were completed and the dates of July 1 to August 31, inclusive, were set for the concentrated action. A bogey of 1,000 automatic water heaters was set for the company's direct sales and each of the company's thirteen geographic divisions was given a quota to make up that amount. A running record was kept of the heaters sold and awards were made on the point basis. Liberal terms of \$5 down with the bal-

ance payable in 18 monthly payments were offered to customers, and as a special inducement and premium a Cannon towel set having a retail value of \$10 was given. The campaign was designed to tie-in on a co-operative basis with the dealers.

Thirty days in advance of the start of the campaign, all dealers, plumbers, and merchants selling automatic gas water heaters were advised of the campaign, giving a complete outline of its scope and the opportunity of selling their merchandise on the same terms, using the same premiums.

A greater employee interest was stimulated through the offering of a \$2.50 bonus for each prospect submitted by employees. Any employee submitting five prospects which were closed was given as an added bonus a set of the Cannon towels.

The division making the greatest outstanding sales in the campaign was presented a trophy given by A. F. Hockenbeamer, President of the company. H. M. Crawford, general sales manager, presented two duplicate trophies, one to each of the division sales managers attaining the highest per-

Mr. Jordan is manager of the publicity department, Pacific Gas & Electric Co., San Francisco, Calif.

**Men like hotels and clubs because they get INSTANT hot water**



Every thoughtful man can have automatic hot water service at home. Then it is easier to keep things neat and fragrant. Each week you can have it in 6 hours more time for morning, shopping or outdoor sports.

There is no need of watching the automatic gas water heater. You can have hot water any day.

It costs less than one-fifth of a cent per gallon—the lowest cost of any method for heating water in the home.

Details on replacing your old water heater with a new automatic gas water heater can be obtained at a dealer's store or by calling at our local office.

PACIFIC GAS AND ELECTRIC COMPANY

**P-G & E**  
Owned, Operated, Managed  
by Californians

311-122

**"Come on dad, mother is ready!"**



**Plenty of hot water the instant you want it, saves your time for pleasure**

Quickly mother's hands finish the housework. She saves countless minutes by having plenty of hot water without boiler or waiting. Each week she has 4 to 6 hours more time for morning or other pleasures.

There is no need of watching the automatic gas water heater.

You can have plenty of hot water day and night. It costs less than one-fifth of a cent per gallon—the lowest cost of any method for heating water in the home.

Details on replacing your old water heater with a new automatic gas water heater can be obtained at a dealer's store or by telephoning our local office.

PACIFIC GAS AND ELECTRIC COMPANY

**P-G & E**  
Owned, Operated, Managed  
by Californians

311-122

**Any woman who doesn't have instant hot water . .**



**is spending 4 to 6 hours longer each week in housework!**

Here all the hot water you want without boiler or waiting. Then housework is done easily and quickly. Each week you can spend 4 to 6 hours more with friends—morning, shopping or engaging in outdoor sports.

There is no need of watching the automatic gas water heater.

You can have plenty of hot water day and night. It costs less than one-fifth of a cent per gallon—the lowest cost of any method for heating water in the home.

Details on replacing your old water heater with a new automatic gas water heater can be obtained at a dealer's store or by telephoning our local office.

PACIFIC GAS AND ELECTRIC COMPANY

**P-G & E**  
Owned, Operated, Managed  
by Californians

311-122

Here are typical newspaper advertisements used during the successful campaign



centage of quota attainment in his group. Special awards were made to salesmen, the first prize being a trip to the Pacific Coast Gas Association convention, and the second prize being \$50 in cash, the third being \$35, the fourth \$25, the fifth and sixth prizes \$15. A durable brief case was presented to each salesman attaining a quota of 25 points. A telechron clock was presented to the first ten men attaining a quota of 35 points. Weekly prizes of \$1 were given for each point earned by salesmen in excess of three points a week.

In this campaign three makes of heaters were featured. The company's division managers were permitted to select one or two of these makes as leaders for their territory.

An intensive advertising campaign featuring the advantages of hot water was carried on in all of the newspapers in the gas territory. This was supplemented by a special consumer campaign broadside with postcard which was mailed to consumers throughout the territory. Other miscellaneous sales aids, bill inserts, folders, and special window trims were used. A special broadside was made up and mailed to each of the company's employees, advising them of the campaign and the opportunities for bonuses through their active support and participation.

Prior to the beginning of the campaign, "pep" meetings were held in each division and talks were made by representatives of the sales department, the publicity department, and the local jobbers.

A great deal of enthusiasm was displayed by the employees and divisional representatives. Some of them went so far as to prepare one- and two-act playlets of a comic nature with emphasis on the ridiculous aspect of not having automatic hot water service.

Dealer cooperation was stimulated and live dealers throughout the territory tied-in with special advertising and sales helps provided by the company, jobbers, and distributors.

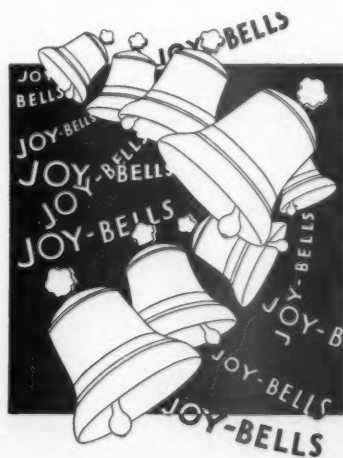
The campaign resulted in the sale of more than 1,100 automatic water heaters by the

company's salesmen, and through latest check available it is indicated that more than 4,000 were sold through plumbers and other dealers. This combined effort of the company's sales force, its regular employees, and the dealers resulted in a greater stimulation of automatic water heater sales. Many prospects were received during the campaign and these will provide a substantial list for salesmen to use as leads for further sales.

#### Other Campaigns

This campaign, conducted by A. C. Miller, domestic gas sales engineer, is but one of several designed for the promotion of the sale of gas equipment carried on by the company throughout the year. The company maintains a regular sales force in each of its territorial divisions and special campaigns featuring water heaters, house heating equipment, gas ranges, etc., are designed to stimulate sales at the time of the year when the sales resistance for the particular lines is the greatest.

Through the company's aggressive effort and its far-flung activities there is stimulated a greater interest in gas-consuming equipment with the result that the entire trade is benefitted.



The general theme of the campaign was used as a cover for this folder designed to gain employee interest and action



## Research Will Show the Way

By OSCAR H. FOGG



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To an industry which has adopted scientific research as one of its allies, consideration of the value and importance of research is always interesting. Col. Fogg gives here a brief and careful summary, and at the same time shows how research will help abolish smoke and help gas do the other things it is destined to do

THERE are some who appear to believe that the word "research" is being abused through what they regard as its promiscuous application to most of the problems and perplexities of ordinary business life. Its proper place, they feel, is only in the exalted sphere of pure and unadulterated science.

In the gas industry we look upon the word with no such veneration. We prefer the exact and literal dictionary rendering, which defines research as a "diligent investigation for the purpose of adding to human knowledge, or careful and critical inquiry or examination in seeking facts or principles."

All successful industries today employ those principles of critical self-examination and recognize them as being vital to the safe conduct and healthy development of the enterprise. The modern policy is to search out our deficiencies, diagnose and correct our ills, and strive unremittingly for permanent improvement in all our ways. Out of that method during the last several years has developed a well-planned and coordinated program of research that will have an ever-growing influence on our future progress.

Presented at annual meeting of The Empire State Gas & Electric Association, Saranac Lake, N. Y., September 19.

I would like to restate the purpose of that program, if only to emphasize the fact that basically it is the combined and coordinated effort of an entire industry, submitting itself to a diligent examination as to the scope of its present knowl-

edge and the efficacy of its existing methods for the purpose of disclosing avenues of improvement wherever they may lie.

Among such possibilities is the happy if somewhat ambitious prospect of producing a substantially cheaper gas that would at the same time be more complete than the present commodity as well as non-toxic in character. That statement contains three factors that perhaps require some explaining.

By more complete I mean a gas that would require no primary air, and thus remove the necessity of burner adjustments to secure the most efficient combustion. By non-toxic I mean a gas devoid of all asphyxiation hazard, either in the free state or in the products of combustion. By cheaper I mean at a cost substantially lower than that realized in the best and most efficient production processes of today.

Coupled with this it is likely we would also mention such contributing factors as rate structure, sales efficiency, etc., which in

the course of time should enable gas to displace all bulky smoke-producing fuels. Once launched upon such a flight of fancy, we would surely not omit a continuous development and progressive improvement in the practice of public and industrial relations, nor could we ignore the benefits of applying sound systems of regulation whose salutary object will be to reward enlightened management and share the enlarged prosperity thereof equitably among the owners, the consuming public, and the employees. I need go no further than that. These modest requirements are enough to outline a truly utopian picture, which, many will say, the longing gaze of the genus gas man will never rest upon.

But is it so impossible after all? I am ready to admit that any such prospect in its entirety will probably be little more than an alluring vision for many a day to come, but the truth is that sober thought is turning in just such directions as these, and progress toward achievement of so-called impossible things moves with lessened obstruction in the form of ridicule, or from what we charitably assume to be reverent adherence to time-honored methods and traditions.

This new mental attitude owes much of its existence to actual accomplishments and demonstrations of the power of applied research to effect improvements and economies in the various departments of our service. Among the fruits which are already appearing above the surface are certain shifts in the character and kind of gas-making materials, increasing mechanization of plant and operations, vital changes in distribution practice, and readaptation to meet changed living conditions and the new requirements of industry.

Further exemplifying the spirit of progress that I believe dominates the gas industry today, we find catalogued among the research activities of the American Gas Association no less than 73 searching inquiries into various phases of the industry's operations, ranging from those of a commercial character—applying the word research in its true and literal sense—to projects in the

field of pure science. "Catalogued" is also used here literally, for so far-flung are the outposts of research that they require a catalogue properly to enumerate and place them. A compendium of research activities of the American Gas Association was published last year, but is already out of date, some measures having been successfully completed, while many new proposals have been undertaken or scheduled for early study.

William Sibley has said that at no time in history has it been so imperative that we keep thoroughly informed of present-day developments. Entire industries rise with the rapidity—I might say regularity—of the dawn, and through the same circumstances industries once basic and well-entrenched find themselves suddenly with a lost or declining market.

It has also been said, and truly, that the proper study for the industrialist is mankind—a very necessary study for the utility man. Only the industry that understands the wants, needs, and dispositions of the public can satisfy the public. Obviously, then, the scope of our research must embrace fully the changing conditions of American life. It must consider, separately and together, all of the conditions that have any bearing upon the future demand for our service. In short, it must extend beyond our own immediate activities and concerns to include the entire field of our markets and the opportunities for extending the use of our product.

You will be interested, I am sure, in a brief summary of the classifications and headings under which this work of research is being directed, and which is contained in the Association's catalogue. I will not attempt to recount them here. As now constituted, the syllabus takes up seven definite projects in the field of accounting, in distribution nine projects, in marketing 17 projects, in production nine, and in utilization 31.

It is particularly significant and not at all by chance that out of all these separate and distinct research projects now actively in hand—a total of 73—approximately two-thirds or 48 are directed at problems

in the field of marketing and utilization, which, to my mind at least, shows where our greatest need for self-improvement lies.

But this is by no means to suggest that we are satisfied with our status in other fields. The figures which I have just given show that we are far from satisfied, and that there are some major problems to be solved in these other branches of our business. Our program of activities, which directly reflects the needs of the industry, does rather emphatically demonstrate, however, that development and expansion of gas service through improvement in our methods of marketing and utilization is of outstanding importance.

The encouraging thing is that every one of the research projects that I have referred to is actually under way; while others that have been projected will be undertaken as rapidly as our funds and general resources make that possible.

According to a recent computation by the National Research Council, in 1927, there was spent in the United States approximately \$217,000,000 for scientific and industrial research. At the end of that year there were twice as many laboratories in educational institutions and industries as in 1921. That merely indicates the growth of the spirit of research in American industry. To be truly effective and to produce the largest return for the time and money expended, all of these activities must be carefully systematized and coordinated. They must follow an orderly and well-developed plan. We are somewhat proud that the American Gas Association early recognized the necessity of this by adopting a national policy of broad and comprehensive scope as stated in the Association's three- to five-year program of activity. This program was formulated by a group of men who stand forth as the industry's most devoted and progressive leaders. It was not thrown together over night, but was evolved during several months of open-minded deliberation, painstaking work, and earnest thought, with provision for periodical adjustments to enable it adequately to meet changing conditions

and to keep fully abreast of the industry's requirements.

Following recommendations contained in the three- to five-year program, the President appointed a highly important Committee on Coordination of Scientific and Marketing Research to serve as a clearing house of all our research activities.

If you are not already familiar with it, you will be interested, I believe, in a brief description of the process by which any one of our research projects advances from the embryonic stage to the point where a definite activity is authorized to accomplish or advance certain practical and specific ends.

If, for example, as a result of the interest or study of an individual or group—possibly as the outgrowth of a related inquiry—some weakness or deficiency is disclosed, or the necessity appears for improvement or progress along some particular line, it is brought first to the attention of whatever sectional or general committee, by reason of its experience or special knowledge, is best qualified to give it broad and impartial consideration. This is the usual genesis of official action.

Assuming that the usefulness and desirability of investigation is established, the proposal passes in turn to the General Committee on Coordination of Scientific and Marketing Research, where it is thoroughly analyzed and reviewed, for here it is that the value and fundamental importance of the proposed work will be subjected to the most critical examination and test. It will be studied in the light of any comparable or parallel work performed in the past or at present under way, not only within the gas industry, but by outside research groups, institutional laboratories, or similar bodies, with whom reciprocal relations exist.

Not only is much duplication avoided in this way, but the relative merits of various research proposals are established for us and their place in the larger program fixed by the collective judgments of our general coordinating committee. One project may be given precedence over others already in hand. Another may be relegated to a sub-

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## The Real Facts of Industrial Utilization

By J. B. NEALEY



J. B. Nealey

THE battle of the fuels has been actively waged during the past few years in the industrial field, and with increasing intensity, until today the discussion of the fuel policy of any plant or factory is liable to create a furore of confusion. Manufacturing executives, plant and fuel engineers look upon the steadily growing scrap heap of obsolete and uneconomical utilization equipment with growing dismay, and yet it is simply lack of knowledge and correct information that are the principal contributing causes of this waste in apparatus, waste in fuel, and waste in production.

The problem of the choice of a fuel is far too complicated for the average factory head or plant executive to take the time to master along with his other multiple duties, and yet for many of them it is their most vital question. However, the problem as to which is the best fuel to use is one that can be and is being solved every day in all of its complicated phases.

In examining present-day fuels we find that coal is still our cheapest source of heat energy and then follow oil, gas, and electricity in the order of their "first cost." This order does not hold exactly in every case for the prices of these fuels vary in every community in the country and it may conceivably be upset at a few geographical points. Both oil and coal might cost more than natural gas in some sections of the Southwest, in some other parts oil may be cheaper than coal, while at Niagara Falls electricity might conceivably be cheaper than coal, oil, or gas.

When we consider that the term gas covers blast furnace gas, producer gas, blue gas, coke oven gas, natural gas, oil refinery gas, and liquid butanes, in the order of their

B.t.u. content, we are not surprised at the chaos such a variety of fuels creates in the minds of plant executives when looking for the best fuel to use in their factories.

In the modern mechanical furnace, that type in which some mechanical means is incorporated to keep the product moving, coal is practically eliminated. In the modern periodic furnace it is practically out of the picture, in spite of its cheapness, for the following reasons: Lack of control over temperature and rate of heating, excess labor for firing and for coal and ash handling, storage for coal and ashes, dirt, poor working conditions, and loss of production while waiting for the furnace to heat up or regain the desired temperature after cleaning fires, etc.

Oil would seem to be an excellent fuel in many respects, but many factors put this out of the running also. One of the most damning and least recognized of these is the waste room that must be incorporated in an oil-fired furnace design to allow for the combustion of this fuel. Oil must be gasified before it will burn and the atomized oil must pass through the relatively slow stages of vaporization, gasification, and combustion before such gases may come in contact with any furnace part.

In some cases the heating chamber must be three or four times as large as that of a gas furnace doing the same kind and amount of work. The large waste of fuel is at once evident. Hot spots and ununiformity in heat distribution follow, and if the user specifies that the temperature variation within any part of an oil furnace zone be kept within plus or minus 10 degrees, this automatically bars it from consideration. Other disadvantages include shutdown through stoppage of the oil flow at the burner nozzle by dirt inclusions; tanks, pumps, steam lines, etc.; uncontrollable furnace atmosphere; change in composition and calorific value; short life of equipment; high repair and replacement cost; unwholesome working conditions; greater fire hazard; etc.



At the top left is a picture showing the annealing of strip steel continuously, automatically, and at a high speed in a battery of gas furnaces. At the top right is shown an automatic gas forging furnace. Billets weigh-



ing 70 lbs. each, 25 in number, have been forged from one of these billet heaters in 15 minutes with no deviations in temperature. At the bottom is a view of the open hearth in a Ford plant

In developing one or two of these points we might state that the heavier hearth required for the oil furnace absorbs a comparatively large amount of heat which destroys the sensitivity of control, for it acts to continue a too high temperature when a lower is immediately imperative and vice versa. On the other hand, maximum sensitivity of control, both of furnace temperature and atmosphere, is to be had with those fired with gas, because light hearths are used and in many types, such as continuous conveyor furnaces, no hearth is employed.

This narrows the field down to a choice between gas and electricity as the best fuel for the modern refined furnace application. These are recognized as the two preference fuels, the latter being here called a fuel instead of energy for the sake of brevity.

The two greatest of all the factors that make gas supreme over electricity are its much lower cost and the fact that with its use any desired furnace atmosphere, reducing, neutral, or oxidizing, can be readily obtained and automatically maintained. This latter advantage bulks large when it is remembered

that control of the atmosphere within the furnace is a dominant factor in present-day furnace design, for those industrial heating operations wherein this factor may be neglected are few and far between. Atmospheric control cannot be obtained within an electric furnace unless gas or some other outside medium is forced into the heating chamber, and every time a periodic electric furnace is opened for recharging, an atmospheric change immediately takes place.

The modern gas furnace has its burners sealed into the setting so that it operates under positive control with a slight back pressure which excludes the outside atmosphere.

Occasionally there is an executive who considers electricity in the light of a "trick fuel" and who shows a decided preference for it in spite of its cost and weaknesses. With the present cost finding systems and the impossibility of always giving full benefit of intangibles, it is quite easy for such an executive or engineer to prove that electricity or any one of several fuels is the most economical fuel for certain heating proc-





*Here is an ingot made in a large gas-operated furnace*

esses. It frequently can be made to appear to show higher thermal efficiencies.

Electricity, however, cannot compare with gas as to flexibility, that is, range of control from maximum to minimum temperature and rates of heating in a given furnace. Furnaces utilizing it are notorious for frequent and costly shutdowns. Its use constitutes a vastly greater fire hazard and danger to life. Its lack of atmospheric control has been mentioned and considering its present cost and efficiency from the coal pile to the finished product, electricity would become an important heating medium only if its present efficiency could be doubled or its cost cut in half.

City gas (manufactured and natural) in the last analysis is the only fuel that combines all of the characteristics demanded by industry, and when given proper credit for all of the tangibles and intangibles provided by these characteristics it will be found to be the cheapest fuel in almost every case. Hence, gas is the best fuel for industry. We summarize its advantages as follows:

- Close control of furnace atmosphere.
- Close control of furnace temperature.
- High overall efficiency.
- Uniformity of product and production (increased output and decreased waste).
- Better operating conditions.
- Smaller size of equipment and furnaces.
- Constant composition and calorific value.
- Constant supply—no shutdowns.

Lower repair and replacement costs—increased equipment life.

Uniformity of heat and heat distribution.

No waste space for stored fuel.

Cleanest, least hazardous, easiest handled, and best controlled fuel.

Taking these and other factors into consideration, it is clear that it is justifiable to pay a somewhat higher actual fuel cost for city gas than for other fuels. The cost per day is not the item that counts in the long run—rather it is the overall cost of a unit product on the shipping floor. It is through this fulsome and adequate line of reasoning that the application of city gas is being extended in industry at a constantly accelerating rate.

In the field of mass production, the box gas furnaces have been redesigned, lengthened, and equipped with traveling conveyors and other mechanical means for passing the work through continuously. The speeds of these conveyors are so regulated that the exact heating periods are maintained for each individual product being treated. The furnaces are divided into zones with automatic temperature controls in each so that the correct heat gradient is maintained. Gas-air proportioning devices automatically maintain required atmosphere. Thus the furnace becomes an automatic mechanical tool needing no attention on the part of labor. Its production is multiplied, its product is standard, rejects are almost eliminated, its utilization of

(Continued on page 634)



*Open hearth steel furnaces (gas)*





Some of the pages of that interesting paper "Pause"

## Some Publicity and Publications of European Gas Men

By C. GEORGE SEGELER

WITH the frequent appearance in the magazines of stories of developments of a technical nature in various parts of the world, it might be a good idea to look at some of the publicity methods and some of the publications which the Europeans prepare for the gas men.

In this field, there is no question that the French have surpassed everyone with their daring attempt to steal a march on the regular magazines for women published in France. The French monthly, *Gazette du Foyer*, edited by Marc Dubu, is an attractive rotogravure paper somewhat like the Sunday supplements of our metropolitan newspapers. The outside pages are in rotogravure, and carry photographs with the widest appeal on all subjects. A copy of the issue of the 25th of July has photos by *Wide World*, *International*, *Graphic Press*, *Daily Mail*, and others, with the usual fondness for bathing beauties and action photos showing a human interest story.

The back page of the *Gazette* is devoted to movie reviews with rotogravure cuts of the best scenes from the pictures. In the issue mentioned we have a scene from Maurice Chevallier's "Innocents of Paris" and others. Other pages are devoted to women's styles, together with patterns, and instructions on how to make clothing and

embroideries. The inside pages carry a full-length novel written by French authors of note, as well as recipes, and "Advice to Aunt Monica" on how to bring up children, preserve vegetables, and spend a summer vacation. Usually one or two short articles on gas equipment or the use of gas equipment will be found as fillers. The advertising is devoted exclusively to gas appliances, and it is by means of advertising that the whole plan has been put over.

The magazine is sold to consumers of gas companies by the meter readers or bill collectors, and it costs 25 cents a year for the 12 monthly issues. The meter reader receives five cents of this 25 cents, provided that the number of meters which are read per day is not decreased beyond a certain amount.

Reader interest has been aroused to an extraordinary degree by the prize contests held every few months, and giving a long list of prizes after a first prize of \$1000. In order to try out the effectiveness of this magazine distributed to gas customers, the original subscription lists were opened in all of France except the five largest cities, Paris, Marseilles, Lyons, Nantes, and Lille. In the short time that the work has been under way, more than 250,000 paid subscribers have been secured, making this



Page one of the French paper

magazine the largest paid subscription magazine in France. Fortunately for the gas industry in France, there are no publications paralleling our Sunday rotogravure supplements, nor our home publications such as the *Ladies' Home Journal*, *Modern Priscilla*, or *Good Housekeeping*.

The French make use of incidental publicity by means of bill enclosures effectively dressed up in modernistic designs and vivid colors. The picture shows one of the best of the French bill folders—only in black and white the brilliant color effect of purple, white and green is unfortunately lost.

The French have also prepared cut-out pictures and picture puzzles for children, but the correct solution of the puzzles entitles the winners of the contests to credit slips for gas.

By way of digression, it is interesting to note that throughout Europe it is frequently the practice to make use of this form of prize—to issue a certificate entitling the winner to so many thousand cu.ft. of gas

in place of a money prize or a gift prize. The housewives especially are glad to receive this form of prize. Of course, it cannot be effectively used for very large sums, which are usually given in gold or in elaborate merchandise, but for the smaller prizes the gas credit slip is extremely effective.

It is rather amusing to American eyes to see the most brilliant poster work such as has been suggested in the preceding paragraphs used in bill folders and in billboard advertising, only to see, on closer inspection, kitchen equipment such as the water heater and the range as well finished in ordinary black iron without any nickel plating or color of white porcelain enamel, even where the kitchen itself might be portrayed in most strikingly modern colors. We, in this country, can be proud of the advances we have made in the design of domestic appliances to bring them in conformity with the growing attractiveness of the modern kitchen.

The Germans, on the other hand, use a very cheaply gotten up publicity magazine sent to gas subscribers, but it is not comparable with the French at all, because it carries a great deal more gas news, and does not make the same reader appeal as the French publicity work. This magazine is called *Ueberall Gas!*

They have made rapid strides, however, in their cooking contests, which are held

(Continued on page 627)



A piece of French direct-mail matter

## The Insulated Gas Range Improves the Cooking Load

By WILLIAM E. MILLS



Wm. E. Mills

THE rapid strides made during the past five years in promoting the sale of insulated gas ranges, and the entrance of an increasing number of manufacturers into the field indicate that this modern appliance is steadily winning favor as a means of improv-

ing the cooking load.

With a firm belief in the future of gas as a cooking fuel, the manufacturer of today is cooperating with the gas engineer in conserving heat, thereby strengthening the entire chain from plant to appliance to ensure the delivery of maximum service to the consumer.

This is because of a growing realization that greater dependence must be placed upon the ability of the range itself to add to the belief of the user of gas relative to the value of the service rendered. It is the contention of the promoters of the insulated range that proof of an ability to serve with increased comfort, convenience, and a finer economy will encourage the more frequent use of both oven and broiler, and meet as well the claims of a rival industry.

On the other hand, if the limitations of any appliance, new or old, do not permit of maximum results while using heat units, limitations will necessarily be imposed upon the ability of the gas company to increase the belief in gas and the use of gas.

Continued observation shows that the average customer using the more efficient appliance, such as the storage type water heater and the insulated range, through becoming a greater believer in the value of

gas service, uses that service more frequently.

Unless the range has been improperly sold as an appliance which when installed "will cut the gas bill," the customer rarely complains for she has received an equivalent degree of increased service per dollar expended for gas.

One authority, in an editorial commenting on the necessity of conserving heat, has said: "Certainly no gas man will contend that we have reached the last word in efficiency in the construction of our range. Penny for penny we know that we supply the user of gas with more B.t.u.'s than any other fuel, but what we give and what is actually used are two different things."

This contention is apparently confirmed in the following test, made at the instance of the Appliance Research Committee connected with a large organization of gas companies.

B.t.u.'s Required to Maintain a Temp. of 430° F.*		
Type Oven	Cu.Ft. per Hr.	B.t.u.'s
Insulated-Ventilated .....	12.5	6,700
Uninsulated .....	20.9	11,180

\*Size of both ovens—18" x 18" x 14", Pressure 3.5. Both with heat regulator, both by the same manufacturer.

The loss of approximately 4400 B.t.u.'s per hour through the walls of the uninsulated oven finds no parallel in the case of the storage water heater, gas boiler, or industrial appliance, all of which are "insulated" to ensure the delivery of comfort, convenience, and economy.

A prominent editorial writer has stated that "When all is said and done, the range remains the point of greatest contact between the gas company and the bulk of its customers . . . inefficient, wasteful, inconvenient gas ranges can never give service that will put the woman customer in the proper frame of mind to appreciate the value of gas service."

Mr. Mills is gas promotion engineer, The Glenwood Range Co., Taunton, Mass.

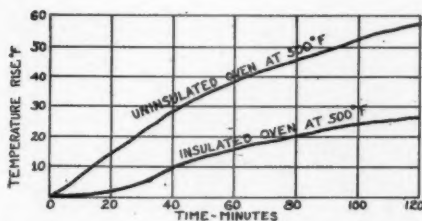


Chart 1—Temperature rise in test room. Temperatures indicated represent degree rise above an existing temperature of 70° F. Both ovens were vented to a flue. Size of test room was 7 x 7 feet, insulated with 18" of cork

An authority, prominent in the merchandising of appliances, has stated: "Just as a poor appliance is a handicap to greater sales of gas and an invitation to our competitors, so a quality appliance, rendering satisfactory service day in and day out, is the gas industry's better salesman for promoting the use of gas in the home."

In analyzing reasons why gas is not being used for cooking to a greater extent, it is obvious that in a majority of cases the use of the oven and broiler has been curtailed because of the extreme discomfort which would result during their operation on hot days. This is referred to in an editorial as follows: "For several years insulated oven ranges have steadily won favor with both the gas men and the gas-using public . . . many women are discouraged from the use of their ovens during the warmer months because of the great amount of heat that is generated—heat that serves no useful purpose in cooking food."

The tests which follow, comparing results obtained with the insulated-ventilated and uninsulated-ventilated ovens, were made by Gordon B. Wilkes, Professor of Applied Heat, Massachusetts Institute of Technology.

All conditions were standardized during these tests, while 535 B.t.u. gas was used at a pressure of 4.9". The ovens were 18" x 18" x 14" in size, similarly ventilated and made by the same manufacturer.

Approximately 50 lbs. of mineral wool were used in constructing the oven tested, while both ranges were equipped with heat control.

### Increased Comfort

The test shown in Chart 1 amply confirms the contention that through the use of an adequate amount of insulating material, comfort may easily displace discomfort during hot weather. This is already having its effect in encouraging a more frequent use of both the insulated oven and broiler.

While a greater measure of comfort is assured when the appliance is flue connected, this desirable result is still possible, but to a lesser degree, where no provision has been made for connection, for the following reasons:

It will be noted from a test which follows that the time and consumption of gas required to raise either oven to temperature varies but little, while at the same time these temperatures are maintained in the case of the insulated oven with approximately one-half the gas required with the uninsulated oven. Hence, there is a lesser volume of heat and flue gases released in a given time through the open vent into the kitchen. Again there is less heat radiated from insulated oven and broiler walls against the person of the user.

Thus does the "cooler kitchen" become an important factor in the encouragement of home cooking, assisting the gas company to meet the growing competition from outside sources and other fuels.

### Increased Economy

That it becomes necessary to conserve the heat units to enhance the value of gas service, making "less gas do more," is illustrated in the test which follows.

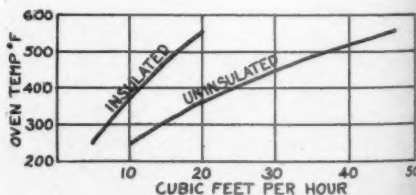


Chart 2—Consumptions to maintain oven temperatures

As shown in Chart 2, the heat units are conserved as well as automatically controlled, which enables the gas company to deliver an economy of operation impossible with any other fuel—a vital means of improving and protecting the cooking load.

Prof. Herbert B. Dorau has stated in a recent article: "Even with scientific rate making, the quality of the appliance is a factor, since the cost of gas to the consumer depends upon the efficiency of the appliance as well as upon the price paid for gas. For this reason an increase in the efficiency of the appliance is equivalent to a reduction in the price of gas."

That the gas company, through the insulated-ventilated gas range, is in a better position to add to the value of its service in another relation is shown in test indicated in Chart 3, which indicates what may be accomplished through the use of retained heat.

In considering this test, note that in the "insulated-ventilated" oven the vent is *never closed*, hence there is a constant circulation of "live" heated air. This obviates the accumulation of moisture or contamination of insulation, and ensures results free from steam taint.

Because of the insulated oven it becomes possible to answer two of the strongest appeals of competitors—completion of operations through retained heat, and keeping the food in good condition when there is a delay in serving the meal.

#### Intensified Cooking Results

In the test whose results are shown in Chart 4, the value of adequately insulating the gas range oven is relative to improving heat distribution. In the "insulated-venti-

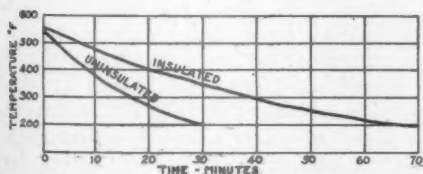


Chart 3—Time required to cool oven from 550°

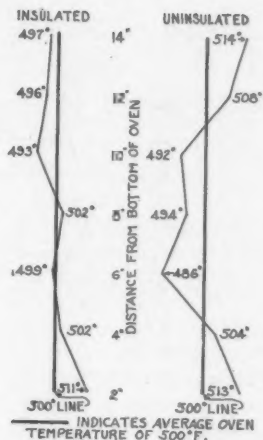


Chart 4—Heat distribution in ovens. Comparisons were made while noting readings of thermocouples placed in identically the same positions in the ovens, after operating for two hours with regulators at 500°

lated" type of range there is a constant circulation of fresh heated air retained with an almost perfect evenness during its passage through the broiler and oven flues to the vent.

An added fineness in the results while baking and roasting is inevitable after the food is placed in any position on either oven rack. The searing process preceding roasting or broiling is carried on with an evenness productive of a finer flavor and texture, while the meat juices are retained with a consequent lessening in shrinkage.

Intensified cooking results while using the insulated range have already been the means of encouraging a more frequent use of the oven and broiler as an important factor in improving the load.

#### Smokeless and Odorless Broiling

Another striking result in improving service from gas is that with the insulated-ventilated range it is possible to broil with practically no smoke or odor issuing from the vent where no provision has been made for flue connection.

Prof. Wilkes has confirmed this result as being "remarkable," and in a report writes as follows: "Fish was broiled until



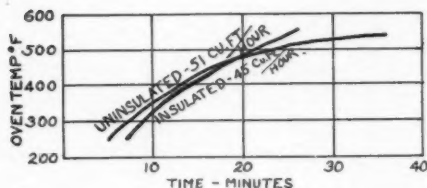


Chart 5—Time required to reach temperatures—adjustment of burners; insulated ovens 45 cu.ft. per hour; regular oven, 51 cu.ft. per hour. Pressure, 4.9—535 B.t.u. gas

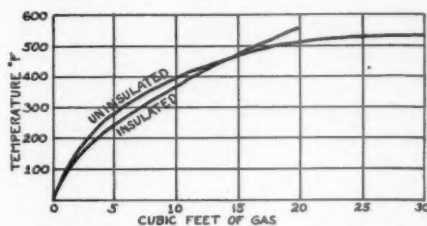


Chart 6—Gas required to reach temperatures

badly charred but at no time was there any smoke issuing from the vent, and only a very faint fish odor. . . . This was undoubtedly due to the higher wall and flue temperature which gives a chance for those gases which cause the smoke and odor to be consumed before being liberated into the room."

This solves the problem for the gas company where no provision has been made for flue connection, and the housewife finds that broiling may be done without discomfort.

The tests plotted in Chart 5 and Chart 6 are in answer to the query regarding the difference in time and the amount of gas required to bring the ovens to temperature.

The necessity for new and more compelling appeals to stimulate interest and belief in the value of gas service is apparent, particularly as the industry is facing competition from other industries as well as other fuels. It is the contention of the promoters of the insulated range that greater comfort, convenience, and a finer economy represent service of a character that will stimulate sales of gas.

An outstanding problem is answered relative to the more frequent replacement of the many thousands of worn-out ranges which use gas so inefficiently that they constantly penalize the effort to serve. The chain of gas service from plant to appliance is no stronger than its weakest link; hence the users of such appliances may now be appealed to in a more striking way to modernize the use of gas or fail to receive the maximum in service from the gas company.

It is also suggested that through the promotion of the insulated range the standard of salesmanship and advertising text is elevated from selling a gas range, to selling an increase in comfort, convenience, and economy in fuel as well as time.

Through recent activities of the manufacturers it is now possible for the housewife to enjoy the advantages of time as well as temperature control—a means of serving better with gas. With every provision made for safety, the housewife may now place the food in the oven and leave the house for the day, confident that the automatic time control will turn on the gas, light it, cook at the required temperature for the proper length of time, and then shut off the gas—thus completing the operation with retained heat.

To the many companies who are facing increasing competition from the automatic type of electric range, a result such as the above is of the utmost importance. Identical results follow the use of heat generated through the use of either gas or electricity *providing both are given an equal opportunity to serve, through conservation*, as well as control of B.t.u.'s. Add to this the fact that top operations may be conducted with greater speed, hence with greater economy, and the gas company has the ability to "protect" as well as "improve" the cooking load.

Continued application of a higher ideal in manufacturing, and promotion of the more efficient gas range, the more frequent removal of antiquated equipment, and intensive promotion of the belief in the superiority of gas as a fuel through modern advertising text—on these things depend the future progress of the cooking load.

## More Cleanliness Material Is Available

THE American Gas Association has announced that a second series of advertisements on the general subject of gas water heating for greater cleanliness is now available. This new material will be of great value for local use by gas companies desiring to tie-up with the national campaign of the Cleanliness Institute.

The series consists of twelve newspaper advertisements and a pamphlet for home service departments.

A manual of suggestions on the advantages of gas-heated hot water as an aid to cleanliness has been prepared for home service directors. The material is in such form that home service directors can fit it into their regular channels of publicity. It includes eight short radio talks, a longer talk for

women's clubs, short items for publication in newspapers, magazines, house organs, etc., and a list of other available material which can be secured from Cleanliness Institute. This notebook is so arranged that alternate pages are left blank for notes.

The series which the American Gas Association released last year was a very popular one, many gas companies using the slogans, radio talks, envelope stuffers, etc. The splendid response received to this activity and the widespread use of the material has led to the preparation of this second series.

Copies of this material can be secured by writing the American Gas Association, 420 Lexington Avenue, New York, N. Y. Most of the advertisements are available in two column sizes.



*the greatest helper in  
washing and drying dishes—  
Hot water!*

HOW easy dish washing is with  
steaming hot water. Dishes  
dry quickly! China gleams!



*the end of  
a perfect game*

PARADISE... a tired body com-  
pletely rejuvenated by hot water.  
No feeling quite like it. Skin is cleaned.



*make it mean  
what it  
says*



*She stoops  
to conquer!*

A BAREFOOT beauty lotion flows  
right from your hot water tap.  
Women who bow to the blessings of



*family  
self-respect  
begins here*

Two family wash! Superior of clean dishes.  
A constant of good habits. Primary aid to  
safety. Let nothing hinder its doing.  
It washes only once and gives a gleaming hot  
water. And you can always have  
hot water with an automatic gas  
water heater. ... Piping hot  
water. Uniform, convenient at all  
times. Economical, because it is  
my lady's chamber. (Woman  
and wherever you wash it.)



*the  
King commands—  
the faucet must  
obey!*

If the service of His Tiny Majesty,  
the hot water tap is always sub-  
ject to call.  
His bath must be drawn and  
tempered just so, his bottles ste-  
rile, his royal majesty washed.  
An automatic gas water heater  
insures constant ser-  
vice, day and night.  
Easy to install and  
not expensive.



*the  
greatest  
beauty secret  
of them all*

STEP into the tub before you step  
out! Gone is that tired feeling.  
Blood tingles. Complexion gleams.  
And there's the added charm of real  
cleansing.  
Is your tub always prepared to  
give you a hot bath instantly? It is.  
If there's an automatic gas water  
heater behind it. Turn the faucet, and  
there's your bath... coming from  
the faucet at any  
time of the day or  
night. Fearless!  
And reasonable!



*I've cleaned it  
...inside and out!*

IT'S HOT WATER. Soap and I are great workers.  
If you use them, we get you clean. We fight  
the battle of cleanliness in cracks and corners.  
We flush dirt right out of the house! We pre-  
vent your health.  
If you make a choice and order for you to use  
your home. We give you more beauty, health,  
and safety. And we do everything to keep you  
safe. If you have an auto-  
matic gas water heater, I'm  
always ready for any job.

[ Your company name goes here ]

[ Your company name goes here ]

[ Your company name goes here ]

[ Your company name goes here ]

Some of the new cleanliness advertising material now available



## RESEARCH—and GAS

**P**ERHAPS the most critical period ever lived by the gas industry was the one which Gas Light, with its brilliant gas, was to understand the Gas Fuel, the new concept with an even greater future.

The progress of research, now being carried out in duty by the American Gas Association, could have spared our gas industry much labor and no little profit. Having such a program to study fully is one of our best means of treatment against a similar category.

The fact that there is a specialized system of research, to which all departments of the industry are interested and engaged, may be said, in fact, to place the gas business beyond the reach of ordinary competitors. While our research efforts are concentrated, our object is dissemination to do and that we may have an ability as possible and with some of economy to convert.

Inasmuch, with the help of all, we are moving forward at a pace that is as sure and sound as it is swift.



**CONSOLIDATED GAS COMPANY of NEW YORK**  
GEN. R. CORTYVOI, President

# THE ADVERTISING



## OKLAHOMA —where gas costs least!

..... Producing ONE-FIFTH of the nation's supply of natural gas, and one of only six states with an annual raw materials output of more than a billion dollars—Oklahoma merits consideration as a manufacturing location for industries using gas as fuel and for other industries desiring a dependable supply of clean, efficient, low-priced fuel.

First in Natural Gas, Petroleum and Zinc; Second in Cotton and Grain Sorghum; Third in Wheat; Fourth in Lead—Oklahoma lies near the national production center of practically every major raw material.

In transportation, water, labor, living conditions, Oklahoma rates high in desirability. The state is centrally located for national distribution. Her climate is neither severe in winter nor too hot in summer.


To the manufacturer interested in participating in the unprecedented development that Oklahoma and the Southwest are undergoing, we are prepared to supply detailed information pertaining to his line of business. No cost or obligation will be incurred, and all correspondence will be held strictly confidential. ... Write.

## OKLAHOMA NATURAL GAS CORPORATION

Tulsa—Oklahoma City

ONE OF THE WORLD'S LARGEST DISTRIBUTORS OF NATURAL GAS

### INVESTIGATE WHY OTHERS LOCATE HERE



Here soil and water meet, good roads, good up drainage, climate moderate and production; an abundance of cheap electric power; cost—natural advantages in industry.

Within 40 miles of the San Francisco metropolitan bay area live 1,600,000 people—the largest market on the Pacific Coast.

*And now....*  
**a supply of NATURAL GAS  
 to the San Francisco Bay area**

Natural gas is now available for industries in the San Francisco metropolitan bay area. The supply is available from the Buena Vista and Kettleman Hills gas fields, said by eminent geologists to be the greatest gas fields in the world, capable of delivering 600,000,000 cubic feet of gas per day for a period of 75 years.

And now the San Francisco met-

ropolitan bay area, in addition to its many other attractive inducements for industrial development, offers this new find of over 1100 Billion Thermal Unit Gas at particularly low rates.

This Company will place industrial engineers at your disposal. Facts applied to your specific plant will be presented promptly and confidentially to your executives.

Sole for A. G. A. of

"OUTSTANDING FACTORS OF THE P. G. and E."

PACIFIC GAS AND ELECTRIC COMPANY

**P. G. & E.**

Building 1400 Market Street, San Francisco, California  
 General Offices 245 Market Street, San Francisco, California

In the top left-hand corner there is a reproduction of the advertisement, full-page, which the Consolidated Gas Co. of New York is running in the special A. G. A. convention issue of Public Service Management.

The other two advertisements on this page were clipped from magazines with large public circulations. Both of these public utility companies are to be congratulated upon their vision—gas today is one of the drawing cards used to attract industries . . . and the Pacific Gas and Electric, and the Oklahoma Natural are well aware of it.

## EXHIBITION

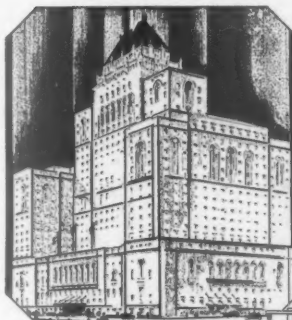
# ERN AS ITS GAS COMPANY

A city's progress is marked by the progress of its service corporations. A true barometer of the modernness of Indian agents is its Gas Company where efficient service and displays of every new and improved gas appliance make possible increased comfort, cleanliness and efficiency in every home.

## THE BLUE STAR HOME

—average in size, cost and upkeep, is an interesting example of a modern dwelling completely equipped for gas. Gas is used exclusively for HEATING, REFRIGERATION, COOKING, LAUNDRY DRYING and other household functions. The Blue Star Home furnished for its country invites your inspection daily 2 to 10 P. M.

**CITIZENS GAS COMPANY**  
"If It Don't Run With Your Gas It's Not Your Gas"



*The Empire's  
Greatest -  
the  
ROYAL YORK  
depends on  
GAS  
to cater  
to its  
thousands  
of  
Guests*

**COMMERCIAL**  
and industrial Toronto prepares to celebrate the opening of the great hotel and congratulates the owners and builders upon the completion of a work that fittingly bears the name

## "ROYAL YORK"

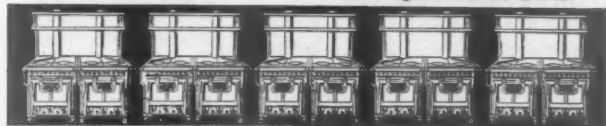
To the manufacturers of Toronto it is a source of gratification that this is the enterprise of a Company whose history is the history of modern Canada and whose policy is consistently in support of the trade that follows the flag around the world.

From the beginning, the words "Canadian Pacific" stood for a splendid faith. Today they stand also for many things more tangible, including this great building, the last word in luxurious and serviceable equipment. The Consumers' Gas Company of Toronto, as one of the City's oldest commercial enterprises, welcomes the new hotel with its twelve hundred employees to the city. The Consumers' Gas Company expresses also its

appreciation of the very large volume of business with which it has been favoured by the Royal York Hotel.

## The CONSUMERS' GAS COMPANY

Hotel Division 124 Richmond St. W.



Immediately above is a reduced copy of a newspaper advertisement which appeared recently in Toronto newspapers. There is news value in this copy, and the layout and illustration are sufficiently bold to create the attention of even the disinterested reader.

The advertisement of the Citizens Gas Co. places the gas company as modern, and the other advertisement shows how the gas refrigerator and gas service are being brought to the attention of the investing public through the Utility Securities Co.

## UTILITY SECURITIES COMPANY

230 South La Salle Street, CHICAGO  
Members: National Securities Association, Inc.  
Incorporated in Illinois—21 Broadway, New York City

## Lincoln Appreciated Value of Gas Service

**D**URING a recent visit to Maryland, James M. Bennett, manager, public relations department, Philadelphia Electric Company, unearthed a letter from Abraham Lincoln to John W. Garrett, written while Mr. Lincoln was President of the United States, which showed that in those days gas service came in for its proper share of appreciation and recognition. Mr. Garrett was the chief executive of the only railroad between Washington and the north and west, and was an important figure in Federal operations at that time.

The letter follows:

Executive Mansion,  
Washington, January 10, 1865.

Mr. J. W. Garrett,

My Dear Sir:

It is said we shall soon all be in the dark here unless you can bring coal to make gas. I suppose you would do this without any interference, if you could, and I only write now to say, it is very important to us, and not to say you must stop supplying the army to make room to carry coal. Do all you can for us in both matters.

Yours truly,  
A. LINCOLN.

## Letter to Newspaper Editor Considers Gas Rates

**T**HE following letter was published in a recent issue of the *Boston Post*, Boston, Mass.:  
"To the Editor of the Post:

"I hope that the voters of Boston can see through the smoke screen that the pol's are putting out about the gas rates in Boston.

"If the people will stop and think, they will realize that it is near election time and the poor pol must make some kind of noise to get votes. If a good part of them were not in public office drawing the people's money they would be hanging around corners bumming from their friends.

"No one said anything about the rates being raised in other parts of the State.

"In Arlington we didn't know anything about it until it was all over.

"The new rate isn't going to hit the poor family and the pols know it.

"The average poor family in Boston don't have electric lights and must use gas for lighting as well as cooking and washing. Take the

poor family with four or five youngsters. The father makes about \$25 a week. The mother must cook three or four times a week. They burn about three jets on the average of four hours a day. The family will use more than 2,500 feet of gas a month and with the new rate will get the gas cheaper than they do now. They HAVE to use gas.

"The one that will get hit is the one that has it for convenience. The one that pays high rent in an apartment house. They will pay more, and they can afford to. If they can't afford to pay 50 cents a month more they should not try to live beyond their means.

"Let the wind of common sense blow away the pol's smoke screen so that the voters will see the light of reason.

"Respectfully,

"S. C. JAQUINTH."

## Found—Another Woman Manager of Gas Company



**A**NOTHER woman who has complete charge of a gas company has been found. She is Miss Flora Kollmeyer, manager of the Columbus Gas Light Company, at Columbus, Ind. The company is a subsidiary of the Great Lakes Utilities Corp., of New York, N. Y.

In the July issue of the *A. G. A. Monthly* it was announced that there were but two women in the world who were in charge of gas companies. These were Miss Mary Dillon, President of the Brooklyn Borough Gas Co., Coney Island, N. Y., and Miss Viola Luhring, manager of the Waverly Gas Co., Waverly, Iowa. Officials of the Great Lakes Utilities Corp., after reading the July issue, wrote the editor revealing the status of Miss Kollmeyer.

Miss Kollmeyer has been connected with the company for about ten years, and has been manager for two years. Columbus has a population of 12,000, and the gas company force numbers 12. The plant itself contains both water gas and coal gas equipment.

Miss Kollmeyer's duties encompass the complete field of managerial activity, including public relations, plant supervision, new business, accounting, collections, etc. She is well versed in plant operations, and engineers who have tried to confuse her with questions have always found her ready with the proper answer.



## Sampling Products of Combustion from Gas Appliances

By F. E. VANDAVEER



F. E. Vandaveer

ONE of the most important considerations involved in testing gas appliances for A.G.A. approval is that of completeness of combustion. Approval requirements of the American Gas Association state that an appliance shall produce no carbon monoxide, this requirement being interpreted to apply within the limits of accuracy of modern types of analytical apparatus. Obviously, if no carbon monoxide is to be permitted, an analytical apparatus of extreme sensitivity and accuracy must be employed and the necessity of careful sampling is apparent. An apparatus sensitive only to 0.1 per cent would indicate no carbon monoxide if 0.05 per cent were present. Therefore, some means of analysis such as the iodine pentoxide apparatus sensitive to 0.002 per cent carbon monoxide or even less must be used.

Even though the analytical apparatus itself is extremely accurate, the results obtained can be no more accurate than the method used in obtaining the sample for analysis.

It is essential that any method of procedure used be capable of giving results which can be duplicated at any time when similar conditions are produced. In this paper are described methods of sampling which have been used by the A.G.A. Testing Laboratory for more than three years, during which time approximately 21,000 samples from over 1,000 appliances have been taken. Some of the precautions necessary in sampling gases, and calculations involved in the reduction of carbon monoxide in the sample to an air-free basis, accuracy

and possibility of checking results, and a description of the sampling hoods for various appliances is included.

Because of the ease of obtaining a sample of gas as compared to sampling solids or liquids, there is very little excuse for taking an incorrect sample. Gaseous products of combustion, however, are usually colorless and the sampler, therefore, cannot see whether or not a representative sample is being obtained. For that reason it is essential that a definite procedure be adopted.

A study of the literature has shown that several good papers on the subject of testing gas appliances for completeness of combustion have included references to methods of sampling. These references and others on the general subject of sampling flue gases are included in the appendix.

### GENERAL CONSIDERATIONS IN SAMPLING FLUE GASES

To obtain a correct analysis of the products of combustion for carbon monoxide it is essential that the sample collected be representative of the whole; for if the sample taken is not a true average of the constituents, the analysis, even though extremely accurate, is not a correct indication of the amount of carbon monoxide present.

Obviously, it is impractical to collect and analyze all of the products, and it is therefore usually necessary to take from the gas stream only a small quantity as being representative of the whole. If the gas stream is reasonably homogeneous, there is very little difficulty in obtaining an average sample, and it is only when the gas stream varies in composition that great care must be taken. Due caution must also be exercised to see that the container in which the sample is retained until it is analyzed does not permit a change in the composition of the sample.

Dr. Vandaveer is chief chemist, American Gas Association Testing Laboratory, Cleveland, Ohio.



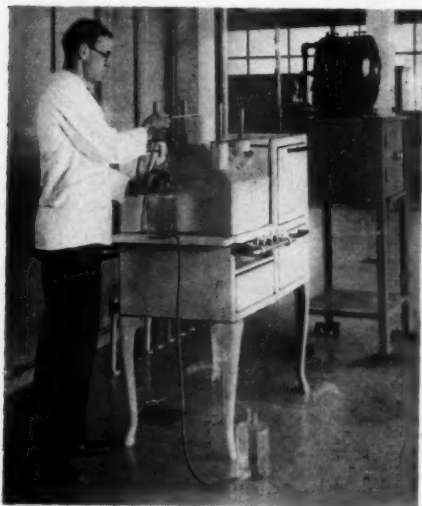


Fig. 1—Equipment and method used in collecting products of combustion from a range

When a gas appliance is adjusted at a given gas rate with no change in gas pressure and after thermal equilibrium has been attained, the volume of products per unit of time excluding the air is constant. The degree of completeness of combustion of the gases from the different burners on an appliance, however, may not be uniform, and the amount of air entrained with the products of combustion may vary considerably. Due to this variation in the amount of air and the uneven distribution of the products, the gas stream from which the sample is taken is not homogeneous, and necessitates careful manipulation to obtain a true or representative sample.

In collecting samples for analysis by means of the iodine pentoxide or thermal conductivity apparatus a limited amount of sample must be taken. It is essential, then, to obtain it from as many points in the gas stream as possible. A convenient and accurate method is to keep a glass sampling tube continually in motion over the entire area of the flue opening. For the carbon monoxide recorder a continuous sample may be drawn through iron pipes from the appliances directly to the recorder. This has

a theoretical advantage of elimination of possible change in composition of the flue gas by any confining liquid. Also, a larger sample may be analyzed, and a continuous record obtained. The disadvantage is that the normal draft around the appliance may be sufficiently increased to cause a poorly-vented appliance to produce no carbon monoxide whereas when operating under its own draft it would operate improperly.

To transfer the sample from an appliance to the iodine pentoxide or thermal conductivity apparatus, various containers, such as glass aspirator bottles, glass collecting tubes, tin containers, and rubber bags, may be used. For routine analysis of a large number of samples it has been found to be more convenient for laboratory purposes to use aspirator bottles of approximately two liter capacity with water as the confining liquid.

#### Effect of Confining Liquid on Sample

As stated, it is of utmost importance that the confining liquid be of such a nature that it will not cause a change in the composition of the gases, either by absorption of part of them, or by giving up to the sample, gases already dissolved in the confining liquid. Water will dissolve an equal volume of carbon dioxide whereas one part of water will dissolve only .0341 parts of oxygen, .0254 parts of carbon monoxide, .0188 parts of hydrogen, and .0168 parts of nitrogen. Carbon dioxide, therefore, is the constituent of flue gas which may be absorbed by water as the confining liquid to such an extent as to change the composition of the sample. This gas is also soluble to a very appreciable degree in acids, salt solutions, and organic liquids. The addition of sodium chloride or zinc chloride and acids to water decreases the solubility of carbon dioxide, but this advantage is offset in routine analysis by several disadvantages, among which may be mentioned caking on the sides of the containers. Water saturated with flue products naturally will not absorb a further amount under the usual conditions. There is a possibility, however, that water saturated with carbon dioxide will give up some of this gas to

the sample. To determine how much change may be noted under the condition of sampling, using aspirator bottles of two-liter capacity, air was allowed to stand over a completely saturated solution for some time. When the air was analyzed for carbon dioxide, it showed 0.2 per cent, which was the same amount present in the air of the laboratory at that time. The aspirator bottle containing the above sample of air was heated 12.5° F., and the air again analyzed for carbon dioxide. No noticeable change was obtained.

A comparison was made to determine the effect on the carbon dioxide content of the flue gas when either fresh water or water saturated with carbon dioxide was used as the confining liquid. Flue products were collected from a gas appliance and placed over fresh water and saturated water, and the regular procedure carried out during routine analysis followed. The sample over fresh water analyzed 1.8 per cent carbon dioxide and over saturated water 1.9 per cent carbon dioxide. Since this difference is within the limit of accuracy of the gas analysis apparatus, it is considered negligible.

#### Description of Hoods for Range Top Burners and Space Heaters

A gas appliance should be so constructed that it will vent its products without depending upon a chimney draft, and should continue to function safely even under a down-draft condition. Where an appliance does not have a flue through which more than 90 per cent of the combustion products pass, it is desirable to use a hood or other means of directing the products of combustion through a reasonably small opening. Such a device may be used provided draft conditions are not changed to such an extent that the process of combustion is in any way affected. In this manner a small portion taken from the gas stream may be more concentrated and a representative sample obtained.

To concentrate the sample in this manner for range top burners and space heaters, the type of hoods shown in Figures I and II



Fig. 2—Method employed in obtaining a sample of the products of combustion from a radiant heater

are used. For range top burners the two sizes of hoods will usually fit any four-burner range. They measure 19 $\frac{1}{4}$ " x 18 $\frac{1}{2}$ " and 22" x 22" at the bottom, with an 8" vertical wall, and from there slope to a 5" flue outlet. On six-burner and three-burner ranges hoods of similar design are used but of a different size to fit the size of cooking top. For space heaters the two sizes used measure 24" x 12" and 30" x 12" at the bottom, with 7 $\frac{1}{2}$ " and 10" vertical walls, respectively, and from there sloping to a 4" flue outlet. In order to counteract the increased draft on some space heaters which are very critical on venting, it is desirable to have an adjustable opening at the top of the flue outlet.

#### SAMPLING FLUE GASES FROM GAS RANGES

It is necessary to take separate samples from the oven and the cooking top from gas ranges having open grates. The sample of flue gas from the oven may be taken



The bottom of the hood is usually placed about level with the top of the radiants. As Table 4 indicates, this method gives accurate results capable of being duplicated.

**Table 4—Illustrating Possibility of Checking Carbon Monoxide Results from a Space Heater when Using the Sampling Hood**

	Per Cent CO Heater No. 1	Air-Free Heater No. 2
First sample .....	0.29	.0465
Samples taken two hours later .....	.029	.050

#### Sampling Flue Gases from Water Heaters, Boilers and Furnaces

Water heaters, boilers, and furnaces are practically always vented, and therefore the sample may be taken at the flue collar. In case a draft diverter is used, the sample must be taken from the flue ahead of the draft diverter in order that air which may be drawn through the diverter is not included in the flue gases passing through the appliance itself.

Figures 3 and 4 illustrate the method of taking samples from these appliances.

#### Reduction of Carbon Monoxide in the Sample to an Air-Free Basis

Of the two variables entering into the sampling of products of combustion of gas ap-



*Fig. 3—Taking a sample of the products of combustion from a water heater*



*Fig. 4—House heating boiler being sampled for analysis of flue products*

pliances, that of non-uniform distribution of carbon monoxide may be minimized by taking the sample from as many points in the flue of the sampling hood as possible. The uneven distribution of air with the products may be minimized by the same method and entirely eliminated by reducing the results obtained to an air-free basis. This also permits duplication of results from day to day and reduces them to a standard basis of comparison. Calculation of results to an air-free basis may be made from the percentage of carbon dioxide or percentage oxygen found in the sample. If it is made from the percentage of carbon dioxide present, it is necessary to know the composition of the gas being burned. This method is the more convenient one to use where the analysis of the gas is known, since the analysis for carbon dioxide is more accurate than that for oxygen, and it is more rapid because in analyzing for oxygen it is first necessary to determine the carbon dioxide content. One method may be used as a check against the other.

### By Analysis for Carbon Dioxide

The following typical calculations in Table 5 based on the analysis for carbon dioxide are involved:

The carbon dioxide in the products of combustion is determined by analysis on an apparatus accurate to 0.1 or 0.01 per cent. To obtain the air-free factor for conversion of carbon monoxide to an air-free basis, divide the per cent ultimate carbon dioxide by the per cent carbon dioxide found in the products of combustion. This factor times the per cent carbon monoxide in the sample gives the percentage of carbon monoxide air-free.

### By Analysis for Oxygen

If oxygen is determined in the flue gases, it is not necessary to know the composition of the fuel gas. When the percentage of oxygen is determined, the following typical calculations are involved:

Composition of products of combustion by analysis:

CO <sub>2</sub> . .	4.8%	(Ultimate CO <sub>2</sub> - 12.25)
O <sub>2</sub> . .	12.7%	
CO . .	.0045%	
N <sub>2</sub> . .	82.4955%	
<hr/>		
	100.0000%	

$$\text{Per cent products of combustion in sample} = 100 - \frac{12.7}{20.93} = 39.2\%$$

Per cent carbon monoxide air-free =

$$.0045 \times \frac{100}{39.2} = .0115$$

Per cent CO on the basis of the CO<sub>2</sub> =

$$.0045 \times \frac{12.25}{4.8} = .0115$$

As indicated by the above calculations either procedure gives the same results.

### Summary

Attention has been directed toward the importance of obtaining a true sample, the elementary principles involved, and some of the precautions necessary in sampling products of combustion from gas ranges, space heaters, water heaters, boilers, and furnaces. Methods which have been in use at the A.G.A. Testing Laboratory for several years have been shown to be accurate, reasonably convenient, and reliable.

It has been shown that:

1. The sampling hoods used on gas ranges and space heaters have no appreciable effect on the operation of the burners.
2. Carbon caused from burning off of the japan on the grates may react with carbon dioxide formed by gaseous combustion to form carbon monoxide and such carbon monoxide should not be attributed to the operation of the burners.
3. Water used as confining liquid in the sampling bottles during the routine pro-

(Continued on page 620)

Table 5—Calculations Involved in Obtaining the Ultimate CO<sub>2</sub> from Analysis of the Fuel Gas

Composition of gas determined by analysis		Oxygen Required	Carbon Dioxide formed
CO <sub>2</sub>	0.034	—	0.034
H <sub>2</sub>	0.039	0.1610	0.117
O <sub>2</sub>	0.004	0.0040	—
H <sub>2</sub>	0.365	0.1825	—
CO	0.258	0.1290	0.258
CH <sub>4</sub>	0.066	0.1320	0.066
C <sub>2</sub> H <sub>6</sub>	0.030	0.1050	0.060
N <sub>2</sub>	0.204	—	—
<hr/>		<hr/>	
1.000 Cu.ft.		0.7135 Cu.ft.	0.535 Cu.ft.
Air required = 0.7135 = 3.41 Cu.ft. per Cu.ft. of gas			
<hr/>			
0.2093			
Products of combustion (dry)		$\left. \begin{array}{l} \text{N}_2 \text{ from air} \\ \text{N}_2 \text{ from gas} \\ \text{CO}_2 \end{array} \right\} .7907 \times 3.41 = 2.695 \text{ cu.ft.}$ $\quad \quad \quad = 0.204 \text{ cu.ft.}$ $\quad \quad \quad = 0.535 \text{ cu.ft.}$	
		<hr/>	
		Total	= 3.434 cu.ft.
<hr/>			
Per cent CO <sub>2</sub> air-free possible = $\frac{.535}{3.434} \times 100 = 15.59\%$			



## The Monthly Tabloid—Personal and Otherwise



G. G. Ramsdell

**S**PECIAL honor was paid George G. Ramsdell, senior member of Association Headquarters staff, at a dinner of the Society of Gas Lighting at the Astor Hotel, New York, N. Y., September 12, upon completion of his twenty-five years of service as Secretary of that Society.

It was on September 12, 1904, that Mr. Ramsdell first assumed the duties of Secretary of the Society of Gas Lighting.

At the appropriate time waiters entered with the birthday cake containing candles variously estimated at from 25 to 75 and with the other ingredients of dessert. As after-dinner features Mr. Ramsdell was presented by his assistant secretary, M. H. Spear, with a leather bound book containing letters of congratulation and appreciation from prominent members of the Society. Representing the organization, A. E. Forstall presented Mr. Ramsdell with a watch suitably engraved. Hon. Geo. B. Cortelyou paid eloquent and appropriate tribute to the life and services of Mr. Ramsdell and this was followed by brief talks by J. Arnold Norcross and Alexander Forward.

William Cullen Morris, the President, was in the chair at the dinner which followed the regular monthly meeting.

Among those present were: G. T. Macbeth, Mt. Vernon, N. Y.; Isaac T. Haddock, Cambridge, Mass; E. E. Witherby, New York; Wm. J. Welsh, Stapleton, N. Y.; Geo. G. Ramsdell, New York; M. H. Spear, Flushing, N. Y.; Col. Alten S. Miller, New York; H. M. Brundage,

New York; James G. O'Keefe, Newark, N. J.; Oliver H. Smith, New York; Alexander Forward, New York; R. O. Luqueer, New York; J. B. Klumpp, Philadelphia, Pa.; George S. Hawley, Bridgeport, Conn.; J. Arnold Norcross, New Haven, Conn.; Frederick A. Lydecker, Newark, N. J.; W. N. McIlravy, New York; Hon. Geo. B. Cortelyou, New York; W. Cullen Morris, New York; A. E. Forstall, New York; R. E. Wyant, New Haven, Conn.; F. C. Weber, Brooklyn, N. Y.; C. S. Fox, Long Island City, N. Y.; H. H. Ferris, Newark, N. J.; Donald McDonald, New York; James F. Hunter, New York; C. C. Simpson, New York; Charles A. Lunn, New York; R. A. Carter, Jr., New York. Among the guests were Mr. Merrifield and assistant, and Gerald B. Gould and assistant.

R. D. Burmaster, assistant sales supervisor of the Peoples Light Company, has been promoted to sales supervisor of the Fort Dodge Gas & Electric Co., Fort Dodge, Iowa.

Previous to coming to Davenport a year and a half ago, Mr. Burmaster was sales supervisor of the Muscatine Lighting Co. His employment by the United Light & Power Co. dates back 11 years.

Nicholas Elbogen recently resigned his position as industrial engineer for the Lafayette district of the Northern Indiana Public Service Co., to become associated with the Derby Gas & Electric Co., Derby, Conn.

In his capacity as gas sales engineer, Mr. Elbogen will promote the sales of gas for industrial and house-heating purposes.

Major T. J. Strickler, vice-president and manager of the Kansas City Gas Co., Kansas City, Mo., has been elected Commander of the Missouri Department of the American Legion.



Members of the Society of Gas Lighting gathered to honor George G. Ramsdell

Hugh H. Cuthrell as acting manager of the new business department of The Brooklyn Union Gas Co., Brooklyn, N. Y., succeeds Prescott B. Wiske, who leaves to become associated with the Erskine-Danforth Corp. of New York. R. H. Staniford and F. D. Tansey will continue as assistant managers.

Mr. Wiske, who is a graduate of Stevens Institute of Technology, has been with The Brooklyn Union Gas Company since July 1, 1911, and has been manager of the new business department since Jan. 1, 1919.

Mr. Cuthrell was born in Winston Salem, N. C. He is a graduate of Lake Forest College and of the University of North Carolina. After service in the World War and in the air forces, he was employed by the Kings County Lighting Co. as engineer of distribution in 1922. He held this position until May, 1927, when he resigned and entered the service of The Brooklyn Union Gas Co. as engineer's assistant. In this capacity he organized the customer's service division. He was transferred to the new business department as sales engineer a few months ago.

Robert G. Guthrie, metallurgist for The Peoples Gas Light and Coke Company, Chicago, Ill., was unanimously elected President of the American Society for Steel Treating at their annual convention, Sept. 9 to 15. It is believed that the Steel Show next year will be held at Chicago, Ill.

Leslie Fairchild was recently appointed engineer of the Sprague Meter Co., Bridgeport, Conn. Mr. Fairchild has been connected with the company for the past 16 years and, before his promotion, was in charge of drafting and designing.

Announcement is made by H. W. Foulds, vice-president of distribution, Servel Sales, Inc., of the appointment of R. R. Guenther as manager of the service promotion department of the Electrolux Division of Servel Sales, Inc.

Mr. Guenther has been with Servel for three years, first in a service capacity and later as Electrolux sales engineer. The department which he heads is of recent organization, functioning as a factory aid in teaching dealers the operation and use of Electrolux. Mr. Guenther's headquarters will continue to be in Evansville.

Notice has been received that, effective August 29, 1929, the corporate name of the Midland Utilities Investment Company, Chicago, Ill., has been changed to Midland United Company.

## Booklet Classifies 500 Business Magazines

MARIAN C. MANLEY, branch librarian of the Business Branch of the Public Library, Newark, N. J., has announced publication of an interesting booklet entitled, "500 Business Magazines Classified by Subject."

This pamphlet will be sent free to all requesting it.

## Announce Another Calendar for 1930

THE Bishop Publishing Co., 308 W. Washington St., Chicago, Ill., have just completed samples of their 1930 calendars for gas utilities called, "BALANCED MEALS AND CANDY RECIPES."

Samples of this will be sent upon request.

Each calendar is printed in four attractive colors in offset process. Two dials are attached to main card—the dial on the left shows even balanced meals with 24 different kinds of meats or substitutes. The dial on right shows seven unusual candy recipes with method of cooking printed on center of card. A set of clock hands are attached to each calendar, and there is also a marketing list containing about 40 sheets.

The two panels on each side give times for cooking, roasting, and baking.



## Affiliated Association Activities

### Pacific Coast Gas Association



F. H. Bivens

**F.** H. BIVENS was elected President of the Pacific Coast Gas Association at its highly successful convention held at Del Monte, Calif., September 10 to 13.

Other officers elected were: vice-president, R. E. Fisher; treasurer, D. G. Martin; executive secretary, Clifford Johnstone; directors, George Campbell, J. P. Coghlan, M. A. Pooler, W. F.

Raber, John Keillor, H. L. Masser, William Moeller, Jr., W. M. Thompson, and Charles H. Dickey.

### The Public Utilities Association of Virginia

**A**DVANCE registrations indicate there will be a record-breaking attendance at the annual convention of The Public Utilities Association of Virginia, at the Chamberlin-Vanderbilt Hotel, Old Point Comfort, Nov. 21 and 22, according to a statement made by President A. W. Higgins, of Charlottesville, Va.

Inasmuch as the convention will take place in the shadow of Fortress Monroe, in proximity to Langley Field and just across historic Hampton Roads from the United States Naval Base, there will be a military note about the gathering. Utility representatives will be greeted and welcomed to Old Point by General Henry V. Todd, Commandant of Fortress Monroe. Other Army and Navy officers are expected to take part in the convention.

Prominent speakers from various sections of the country have accepted invitations to take part in the program. These include, Homer Ferguson, president of the Newport News Shipbuilding and Drydock Co., Newport News, Va.; W. E. Wood, president of the Virginia Electric and Power Co., Richmond; Louis S. Epes, chairman of the State Corporation Commission, Richmond; Louis I. Jaffe, editor of the *Virginian Pilot*, Norfolk, and winner of the Pulitzer journalism prize; Dr. J. A. Burruss, president of the Virginia Polytechnic Institute, Blacksburg; J. N. Shannahan, of the Omaha-Council Bluffs Street Railway Co., Omaha, Neb.

E. A. Hulst, vice-president, Mathieson Alkali Works, Saltville; Billy B. Van, president, Pine Tree Products Co., Newport, N. H.; Miss Eloise Davison, home economics advisor, National Electric Light Association, New York; Mrs. Anna Richardson, associate editor of the *Woman's Home Companion*; T. E. Roach, Na-

tional Electric Power Co., New York; Miss Jessie McQueen, home service counsellor of the American Gas Association, New York; Miss Pearl W. Evans, National Electric Power Co., New York; and Miss Isabel Davie, secretary of the Women's Committee, National Electric Light Association, New York.

Under the direction of N. E. Drexler, division manager of the Virginia Public Service Co., Hampton, Va., the entertainment committee is arranging unusually elaborate features for the diversion of those in attendance. There will be a golf tournament, sight-seeing tours to points of historic interest along the James and York Rivers, women's luncheon, and the climax is expected to prove a surprise, being an unannounced form of entertainment in lieu of the customary banquet.

Special group luncheons of the several utilities represented are expected to be among outstanding events at the convention. Tom P. Walker, vice-president, Virginia Electric and Power Co., Richmond, will act as chairman of the electric light and power group; C. B. Short, general manager, Roanoke and Lynchburg Traction Co., chairman of the Transportation group; E. W. Gilpin, president of the Southern States Utilities Co., Charlottesville, of the telephone group, and W. J. McCorkindale, general manager of the Roanoke Gas-Light Co., Roanoke, as chairman of the gas and water group.

### Wisconsin Utilities Association

**T**HE Commercial Section convention of the Wisconsin Utilities Association will be held at the Hotel Retlaw, Fond du Lac, Wisconsin, October 3 and 4.

The program will include addresses on "Home Modernizing," by J. S. Bartlett, Electric League of Milwaukee; "Merchandising Programs," by F. A. Coffin, The Milwaukee Electric Railway & Light Co.; "Selling Home Service in your Community," by Miss Marie Sellers, Postum Company, Inc.; "The Relationship Between Gas Merchandising and Gas Sales," by Alan C. Davey, Menominee & Marinette Light & Traction Co.; "The Franklin Specification—A Panacea for Poor Lighting," by O. J. Kruse, The Milwaukee Electric Railway & Light Co.; "Teamwork Between the Salesman and the Sale Promotion: How to Plan It," by F. W. Bond, president, F. W. Bond Co.; "Training Courses for Salesmen," by F. W. Huels, Madison Gas and Electric Co.; "The Rural Market," by C. C. Bell, Wisconsin Valley Electric Co.; "The Farmer's Viewpoint," by W. H. Kuntz, Merton; and the message of Association President, G. W. Van Derzee, The Milwaukee Electric Railway & Light Co.

### Southern Gas Association

**A**T a recent meeting of the Board of Directors the dates, April 23, 24, and 25, 1930, were selected for the annual convention of the Southern Gas Association, which is to be held in Savannah, Georgia.

### New Jersey Gas Association

**T**HE September issue of the *Quarterly Bulletin* of the New Jersey Gas Association has been published under the direction of a committee consisting of A. V. Bohn, chairman, Harry Ellis, H. H. Newman, B. A. Seiple, W. P. Adams, Hollis Hart, L. N. Yetter, J. B. Jones, E. J. Menerey, A. S. Phelps, and F. A. Schaefer.

The *Bulletin* is a credit to the New Jersey Gas Association both in appearance and contents. It contains information of particular interest to the gas fraternity and should be well received.

### Sampling Combustion Products

(Continued from page 616)

cedure as carried out at the laboratory has very little effect on changing the concentration of the sample beyond the limits of accuracy of the ordinary gas analysis apparatus for carbon dioxide and oxygen.

4. The results obtained when using the type of apparatus and method of sampling given are accurate to at least 0.01 per cent CO air-free.

### Appendix

1. Technologic paper 212, U. S. Bureau of Standards.
2. Technologic paper 222, U. S. Bureau of Standards.
3. Technologic paper 337, U. S. Bureau of Mines.
4. *Gas Age-Record*, Vol. 56, Aug. 22, 29, and Sept. 5.
5. Gas Appliance Testing Code published by the Pacific Coast Gas Association.
6. Bulletin 97, Bureau of Mines (1915).
7. Bulletin 197, Bureau of Mines (1926).
8. Bulletin 12, Bureau of Mines (1911).
9. Methods of the Chemists of the U. S. Steel Corporation for the Sampling and Analysis of Gases.
10. Gas and Fuel Analysis, Chapter 1, by A. H. White.
11. Gas Chemists Handbook (Third edition) published by the American Gas Association.

### Use of Natural Gas Continues to Grow

**T**HE steady growth of the natural gas industry of the country was continued in 1928, when 1,568,139,000,000 cu.ft. were produced and delivered to consumers, states the United States Bureau of Mines, Department of Commerce, in summarizing data compiled by G. R. Hopkins. This represents an increase over 1927 of 8 per cent, which compares with an increase in petroleum production during the same period of .04 per cent, with an increase in carbon black manufacture of 25 per cent, and of natural gasoline of 11 per cent. Deliveries of natural gas to Canada and Mexico declined from 184,000,000 to 160,000,000 cu.ft., which, when deducted from the production, gives 1,567,979,000,000 cu.ft. as the total consumption for the year.

No important change occurred in 1928 in the matter of rank of the larger natural gas producing States. Production in Oklahoma fell off, but the State continued to hold first place ahead of Texas, where a material increase was recorded. Production in Louisiana increased 22 per cent in 1928, which placed that State within striking distance of California in third place.

The total number of domestic consumers increased from 3,984,000 in 1927 to 4,366,000 in 1928, an increase of 10 per cent. The most important increases occurred in Colorado, following the completion of the Panhandle-Denver line; in Louisiana, after the opening of the Monroe-New Orleans line; and in Texas, following a general expansion of distributing facilities throughout the State. Michigan made a notable gain in number of consumers, following the development of considerable production near Muskegon. Ohio continued to be the leading State from the standpoint of number of domestic consumers, followed by California and Pennsylvania. All three of these States reported an increase in the number of domestic consumers in 1928, though on a percentage basis they were greatly exceeded in this respect by less important States through which trunk lines were laid during the year.

The total consumption of natural gas by domestic consumers in 1928 amounted to 320,877,000,000 cu.ft., equivalent to 20 per cent of the total consumption. This total represents an increase over 1927 of 8 per cent. For the sixth successive year, the average consumption per domestic consumer was lower in 1928, when it amounted to 73,500 cu.ft. as compared with 74,300 cu.ft. the previous year. This decline in average consumption may have been due to more efficient use but it is probable that, had the new trunk lines been in operation the entire year, the average consumption would have increased.

**Natural Gas Department**

S. W. MEALS, Chairman

E. J. STEPHANY, Secretary

H. C. MORRIS, Vice-Chairman

## Gas—An Industry Second to None

By B. J. MULLANEY

IT is good for all of us to have something of that which the unfriendly would call egotism. I mean the unspoken "egotism" that springs from knowing one's own abilities and that gives one self-respect and confidence.

"Egotism" of that kind—self-confidence and assurance in tackling new tasks and new problems as they arise—is also good for an industry. But I sometimes wonder whether we have enough of it and enough of the pride of achievement that comes from it in our industry.

Surely we have ample justification for composite self-confidence and assurance when meeting whatever problems the present or future may hold. Take just one circumstance, old to us but not antiquated in significance—the transformation of our industry from an exclusively lighting industry, to a practically as exclusive fuel industry; and this transformation achieved without recession in either output or revenue, for the industry is today taller and stronger than ever and waxes daily in stature and strength.

Some years ago we used to hear more or less about the gas business having reached "the point of saturation." But it has gone right on showing a substantial increase in output and sales every year.

The most significant and encouraging circumstance about the sales figures of the American Gas Association for the whole country is that the largest gains were made in the industrial-commercial and house heating sales. Another is the rapidly increasing distribution of by-product coke oven gas, and the declining distribution of carburetted water gas which marks decline in our dependence upon oil.

When the general aspects of our industry

are discussed, natural gas development clamors for attention. But who can talk about it with any confidence in even the approximate accuracy of what he says? The facts of tomorrow may make a joke of what he says today, so rapidly is the development and employment of natural gas mounting by leaps and bounds.

You know, better than I, the blessings brought to the mountain states by natural gas. But, if only to prove that we from farther east can hear and see, I cannot forbear mentioning how long-distance transmission lines for natural gas are penetrating your region in all directions. Contemplation of the number and magnitude of these enterprises almost makes one dizzy.

Here is Denver, served by a 22" line from the Texas Panhandle, which will eventually extend to Cheyenne, Wyo., with extensions or branches like that from Littleton to Boulder. Pueblo, Golden, Rocky Ford, La Junta, Swink, Los Animas, Fountain, and many other communities already have or soon will have the service.

To the Southwest there is the line from Ute Dome, N. M., to Durango, Colo. For New Mexico, nearer to the Panhandle field, there are other opportunities for large development. The new line to El Paso runs through the Southeastern edge of the state and a line to Roswell, N. M., via Clovis and Portales, is said to be on the way.

In the other direction there is the great transmission line from Casper, Wyo., or the Baxter field to Salt Lake City, touching Rawlins, Rock Springs, Coalville, Ogden, and many intermediate points. From the same field a line runs to Laramie, Wyo. Similar activity is afoot in northern Wyoming around Worland and Basin. And from each of the main lines there are many spurs.

Presented at recent meeting of Colorado Public Utilities Association.



In Montana, there is already service from the Kevin Sunburst field to Great Falls and intermediate points. Other developments are in the Shelby region, and lines projected into the Black Hills section of South Dakota will give service to Rapid City and eleven other communities. Other lines from Montana will doubtless soon penetrate Washington and Oregon.

The many-sided significance of all this to your region is a challenge to the imagination. As an advertisement, for the attraction of everything that is translatable into cash, it transcends the sum of all that Nature has lavished upon you. And it neither displaces nor impairs Nature's gifts to your region; it is an added asset that enhances the usability and value of what you already have.

For this extension of natural gas into your region means—it must mean—an industrial development hitherto undreamed of out here; industries without any related annoyances; home comforts and conveniences otherwise unobtainable; an influx of capital and population and all the consequences thereof; multiplied opportunities for engineers, salesmen, accountants, sales managers, executives, and all other cogs in the machinery of industry and commerce.

This suggests a practical corollary to the growth of this (natural) gas industry. As it grows throughout the Rocky Mountain region, the men in it will feel more the need of organization without which no industry can flourish or even exist in these times. It is for you to determine, of course, whether this organization can be made more effective through state bodies, as at present, or through a different body. But whichever it may be, you will want—and need—the closest possible affiliation and coordination with the American Gas Association.

The accelerated pace of the gas industry in recent years has been due largely to the influence of the American Gas Association. The Association draws out and focuses the best thought and experience of the industry and makes the net results available to everybody in the industry. It has made, and continues to make, the entire public aware, as never before, of the high place this industry

fills in the economic structure of the country. By its appliance testing laboratory at Cleveland and related activities, it has put the industry in the forefront of industries consciously bent on self-improvement, and the value of that needs no diagramming for anyone who knows the asset-value of good will.

It has initiated and directed much and stimulated all of the research and the promotional work that is producing such marked results in sales, especially in commercial, industrial, and other large-volume sales. And finally, it keeps each of its members up-to-date on everything of concern to the industry that happens, to a degree that no one gas company could achieve for itself.

Regardless of how size and importance may be measured in terms of dollars or statistics, this industry of ours is obviously second to none in social, industrial, and general economic usefulness. The American Gas Association is the most potent single influence for maintaining it on that plan.

### Southwest Committee on Uniform Accounts Meets

WITH three members present, the Southwest Committee on Uniform Classification of Accounts, formed by the American Gas Association, met at the Lone Star Gas Company Building, Dallas, Texas, on Aug. 23.

Present were E. N. Watkins, chairman, Arkansas Natural Gas Corp., Shreveport, La.; L. L. Dyer, Lone Star Gas Co., Dallas; J. R. Abercrombie, Gas Service Corp., Kansas City, Mo., and W. C. Grant, secretary for the Southwest Division of the American Gas Association; W. K. Cottrell, of the Oklahoma Natural Gas Corp., Tulsa, Okla., and W. F. Hartwig, Louisiana Gas and Fuel Co., Mr. Hartwig stating that because of a change in positions he was no longer a member of the committee.

The committee decided that the work of developing a uniform classification of accounts for natural gas companies should be divided by the chairman among the various committee members, each being assigned some classification with which he is familiar in his own work. Before assignment, the work is to be broken down into various accounts such as investment accounts, expenses and earnings accounts, distribution, production, etc.

The next meeting of the committee is tentatively set at Atlantic City during the A.G.A. convention in October.

## Magazine of Wall Street Comments on Pipe Line Development

THE great potentialities of the natural gas industry are becoming daily more apparent with the disclosure of imminent plans for spanning the United States with high pressure pipe lines, according to a special article in the Sept. 7 issue of the *Magazine of Wall Street*, entitled, "Nationwide Growth of Natural Gas Industry Affords Investment Opportunities," by E. H. Baker.

The article continues as follows:

"There are today upwards of 3,000 miles of new high pressure transmission lines either under construction or consideration, involving many millions of dollars in steel pipe and compressor stations. One of the first in this field was the A. O. Smith Corp., which made its first shipment of six trainloads of 22-inch pipe manufactured by an automatic electric arc welding process, about two years ago. Its present monthly consumption of steel plate is 100,000 tons, and it has a capacity of 26 miles of pipe line per day. Already this company has in use or on order about 3,000 miles of its pipe.

"The demand for pipe in the large sizes that are used in the high pressure transmission lines is so great that it is difficult for the pipe manufacturers to secure plate steel fast enough to make the finished material for the pipe line companies. Highly important changes are now in progress in the production of large sizes by the leading steel companies.

"The National Tube Co., whose \$13,000,000 capital stock is wholly owned by the United States Steel Corp., is spending \$20,000,000 and more in turning over its McKeesport, Pa., plant from the lapweld to the seamless type of pipe. This plant will be ready to furnish quantity lots by next spring and will be completed by the end of 1930.

"The Republic Iron & Steel Co., which recently contracted to supply 200 miles of pipe for lines in the Southwest, is using the electrical welding process and recently installed additional capacity with the intention of rolling pipe up to 22 inches and perhaps

larger diameters. The Youngstown Sheet & Tube Co., the third largest steel enterprise, is also planning to develop this method, a new mill now being under construction.

"The new process of welding by electricity is capable of revolutionizing the pipe industry. The pipe is made from a coil of steel ribbon of any length, thus making it possible to turn out pipe of longer dimensions instead of being limited by the length of the furnace.

"With the introduction of less expensive piping in quantity production, the feasibility of tapping the large supplies of natural gas for distribution to widely scattered and distant markets became a fact. A line now stretches from the great reservoirs in the Texas Panhandle to Kansas City, a distance of more than 400 miles and at present the longest high pressure natural gas line in the world. The cities of Los Angeles, New Orleans, Denver, Pueblo, Memphis, Galveston, and El Paso are new recruits in this new gas service.

"A 460-mile line is now being laid out St. Louis from the Munroe and Richland fields of Louisiana and from the same source, a 420-mile line to Birmingham and Atlanta will be completed by the end of this year. Other cities that will soon be connected with natural gas fields or that are under advisement as the termini for new lines include Salt Lake City, Ogden, San Francisco, Oakland, the Black Hills in South Dakota, and Helena, Butte, and Great Falls, Montana.

"All of these high pressure lines, of course, form the backbone of a wide network of feeders to smaller communities throughout the areas they traverse. The question of supply does not worry their sponsors. Upwards of 50 years is the least duration that is expected in most cases, with proper conservation. Of course it is realized that the flow cannot be inexhaustible because natural gas is not replaceable, but a life of at least 20 years is considered sufficient to warrant investment. And there are possibilities of unknown extent. Admixture

## LEADING COMPANIES TO BE BENEFITTED BY NATURAL GAS LONG DISTANCE TRANSMISSION

<b>Republic Iron &amp; Steel Co.</b> .....	Just received order for 8,000 tons pipe—installing additional capacity for larger size pipe.
<b>A. O. Smith Corp.</b> .....	Producing at rate of 26 miles per day, is largest present factor among steel pipe manufacturers.
<b>U. S. Steel Corp.</b> .....	Subsidiary, National Tube Co., spending more than \$20,000,000 in seamless pipe plant; expects large orders.
<b>Youngstown Sheet &amp; Tube</b> .....	Building mill for large size pipe manufacture by new electric welding process; will compete on large scale for natural gas pipe business.
<b>Cities Service Co.</b> .....	Increased investments in natural gas 28 millions in last 18 months; may lay line to Chicago.
<b>Phillips Petroleum Co.</b> .....	Earning power should expand through wider market for its natural gas holdings.
<b>Skelly Oil Co.</b> .....	Connection with Chicago pipe line project should increase income from large natural gas acreage.
<b>Standard Oil Co. of N. J.</b> .....	Potential factor in natural gas development embracing source, transmission and distribution.
<b>Texas Corp.</b> .....	Leads oil group to market pooled gas reserves in Texas Panhandle—planning line to connect with Chicago Insull interests.
<b>Columbia Gas &amp; Electric Corp.</b> .....	Strategic position as holder of largest natural gas acreage, with rapid gain in sales to more than a million customers.
<b>Electric Power &amp; Light Corp.</b> .....	Through subsidiaries and affiliations in strong position to benefit from natural gas developments, including Chicago project.
<b>Pacific Gas &amp; Electric Co.</b> .....	Rapid adoption of natural gas on Pacific coast should expand earnings substantially.
<b>Columbian Carbon Co.</b> .....	Expansion of natural gas markets making its lands of greater value; probability of wider profit margin on its carbon output.

with the manufactured product will prolong the supply indefinitely in many cases.

"It was recently announced that a well making 82,000,000 cubic feet of natural gas daily had been brought in in the new Oklahoma City oil pool. A 40,000,000 foot gas well was recently completed in Wyoming.

"Sales of natural gas in 1928 aggregated more than 1,600,000,000,000 cubic feet, an increase of 10% over the previous year. In the last 22 years sales have advanced 330%. Most of the gain has been due to the large increase in industrial users. An increasing number of manufacturers are turning to gas fuel for its cleanliness, ease of control and tremendous saving in labor as compared with coal."

After giving financial details of several of the more important natural gas companies, the article closes with the following paragraph:

"The rapid progress of the natural gas industry in the past two years has unquestionably enhanced the earning power of those companies connected with it, either through ownership of lands, high compression transmission lines, distribution systems or the production of pipe and other products. Its importance as an economic factor in other industries is certain. Its permanence is assured for a period that may extend from 50 to 100 years, certainly long enough to justify

profitable investment in the securities of the companies whose earnings should show substantial expansion."

### Natural Gas Conservation Committee Is Formed

THE Natural Gas Department of the American Gas Association has formed a Natural Gas Conservation Committee, consisting of the following:

L. B. Denning, chairman, Lone Star Gas Co., Dallas, Texas; Judge H. O. Caster, H. L. Doherty and Co., New York, N. Y.; John B. Corrin, Hope Natural Gas Co., Pittsburgh, Pa.; A. F. Bridge, Southern California Gas Co., Los Angeles, Calif.; B. M. Nowery, Louisiana Gas Co., Shreveport, La.

### Booklet on Gas Line

A VERY attractive booklet of 32 pages entitled, "Natural Gas throughout the Heart of the Industrial Southwest," has been published by the Southern Natural Gas Corporation.

The project of transporting natural gas to Birmingham and Atlanta is discussed in the booklet.

### Laclede is Building New Holder

CONSTRUCTION has been started on the new 10,000,000 cu.ft. capacity gas holder for The Laclede Gas Light Company, at St. Louis, Mo.

The new holder is being constructed to take care of the increasing gas consumption in the northwestern part of the city.

## Accounting Section

F. H. PATTERSON, Chairman

H. W. HARTMAN, Secretary

J. L. CONOVER, Vice-Chairman

## Research and Statistics—Essential Factors

By JOHN WILKIE

AS a principal basis in this present industrial age for the establishment of business policies and for executive action and control, statistical research has superseded the old "Rule of Thumb," and has introduced into the executive offices of industry, once tenanted by the rare individual who could administer his business largely by hunch and intuition, the twenty men who rule by the interpretation and the painstaking analysis of reports and figures. Such individuals were James J. Hill and Andrew Carnegie, whose power and imagination and whose confidence in their industries and in the development of the nation's prosperity established them as leaders in a pioneering rather than a competitive era; but today research of markets and costs as well as of products and processes can alone enhance or even maintain the prosperity of an individual industry.

To meet these demands of business in constant studies of the intense present-day competition that puts a premium on accurate knowledge and amplifies many times the danger of conclusions drawn from inadequate premises, there are being developed great refinements of analysis. The methods range from arithmetic to trigonometry, and from the determination by simple observation of the market in a single community to an analysis of the national market for some retail product that may involve a year's work; but they are all based on primary data, on statistics. These are two kinds—first, records and their recapitulation with the significance of the data to be determined by others; second, the compilation and deduction of basic facts about a specific subject in such manner, and according to such processes, as to draw and substantiate constructive conclusions.

Mr. Wilkie is with The Central Hudson Gas and Electric Corp., Poughkeepsie, N. Y.

Nearly every business organization uses statistics in the first sense; while, in the second sense, involving expensive staffs and facilities, a certain few organizations have become preeminent. Insurance companies and Federal Reserve banks have engaged in extensive research to determine, for example, the effect and correlation of credit and trade conditions on particular businesses and on the purchasing power of particular groups of people.

An insurance company, for example, grown to greatness through the sale of millions of dollars worth of life insurance policies found that an average wage reduction of ten per cent in a certain coal-mining territory in western Pennsylvania reduced the number of new policies sold over fifty per cent; and it has since spent many thousands of dollars in studies to determine at what point compensation and an established standard of living leave a margin of income adequate for savings and insurance, and under what conditions and to what degrees this margin may be expected to vary. Similarly, the American Telephone and Telegraph Company has made thorough studies of the trend of industries and population in connection with market analysis to determine its future capital and staff requirements. Endowed research organizations have related living costs with sociological development; investment trusts have profited greatly as their studies persuaded them that certain securities held more favorable prospects than others; the Department of Commerce, through its analysis of foreign trade, exchange, and purchasing power, has pioneered in the discovery of American export markets and added immeasurably to the wealth of American industry. And every day businesses are studying their markets,

prices, costs, efficiencies, and their future in a competitive civilization.

Utilities, because of the assumption of an assured income, as a result of their monopoly character and their regulation by commission, cannot exempt themselves from making this extensive analysis to further the maintenance and development of their business. Traction companies, of course, have found that no assurance of income can stand against unforeseen economic changes; for the development and popularity of the automobile, combined with its reduced price and the greater purchasing power of the American people has proved to be a factor of such tremendous proportions that in a short period of time it forced the traction industry far back in the competitive race. The manufactured gas industry itself was faced for a number of years with declining domestic usage of gas; but through research into industrial uses, and particularly through analysis of the extent and purchasing capacity of the domestic market, and the consequent promotion and sale of domestic appliances, this trend has been substantially corrected.

The extent and character of the gas and electric market have for its basis several factors, including change in population and changes in the character of population from rural to urban or industrial and vice versa, consequent changes in purchasing power (that is, compensation in terms of the cost of living and the living standard), the growth of public familiarity with the uses to which gas and electricity can be put, and the effect of fluctuating consumption of large industrial customers in contrast to the relatively stable consumption of small commercial and residential customers.

Our own company has for several years conducted an extensive annual market analysis; but, with the urge always to apply sales effort where resistance is least, that is, to the least saturated section of the market, provision has recently been made to classify all our customers according to the size of their houses, the character of their businesses, and the relative wealth of the area in which they are located. A study of

monthly usage will then indicate groups of customers having relatively low density of usage; and this, in comparison with the high usage groups and considered with the operating expenses of similar classes of commercial outlets as shown by business research bulletins and by the new federal distribution census, would indicate the amount of electricity and gas at stated rates that each class can use and afford.

Prices or rates which will be conducive to the maximum of use and utility are determined also by studies of the amount and character of consumption, of the opportunity of fostering new uses and of the cost of the service. A company's accounts will, of course, provide the basic quantities for such studies; but due to the necessary routine involved in bookkeeping, separate studies allocating and redistributing these accounts are required to establish for example the special costs incident to billing and maintaining relations with a customer, to providing the necessary generating and distributing facilities, and to furnishing the actual gas or electricity used, in the form of a commercially practicable rate.

This allocation of costs, obviously, can at best only follow the soundest rate theory; and in fact Samuel Ferguson, president of the Hartford Electric Light Company, in a recent address at Yale University expressed the idea that no cost allocation can be 100 per cent correct because of the fact that no two persons will allocate every item of cost in exactly the same manner. But with the object always of analyzing a specific service so that only those costs which it actually incurs may be charged against it, it becomes apparent that constant research must go hand in hand with cost-accounting and rate theory in defining degrees of fixed, varying, and increment costs in terms of maximum usage to the company and maximum value to the customer.

Operating efficiency, as a practical step toward the dividend checks and as a goal in itself representing the highest degree of accomplishment, is another corollary to the function of research. For, in the event of

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**Publicity and Advertising Section**

E. FRANK GARDINER, Chairman

JAMES M. BENNETT, Vice-Chairman

HOWARD F. WEEKS, Secretary

**Publicity and Publications of European Gas Men**

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at regular intervals in all parts of the country. These contests are run in various ways, but the most popular is to set up identical equipment in a large auditorium, and provide each contestant with the same quantity of food to be prepared. The contest is based on speed of cooking, quality of the work, but principally on the gas meter reading, for each range is connected with a special gas meter with a large visible dial which the judges and spectators may watch as the contest proceeds.

The gas company in Berlin has a novel bill insert plan which consists of printing the bill on the back page of their monthly house organ, called the *Pause*. This little eight-page organ is entirely devoted to gas publicity, and carries on the back page the blank for the bill. It is practically impossible to pay one's bill without at least thumbing through the house organ. In that way, it should be much more effective than bill inserts, which are likely to be thrown away as advertising matter without even being looked at. The rear page carrying the bill has in one issue that is at hand the invitation to take part in the prize-cooking contests. These were the finals to decide the winners for all Germany. Germany is divided into eight districts, and in all 45 district winners had assembled in Berlin to take part in the finals. The district winners vary from two in the provinces of Brandenburg and Mecklenberg to ten in the Rhineland. Admission to the cooking contests was 25 cents each, and included the afternoon tea which is served. The prizes were very liberal, and whether the participants won or lost, they were entitled to keep the expensive aluminum cooking equipment which was given to them on entering the contest.

The outstanding event of 1929 in the gas field of Europe was the giant Exhibition

of Gas and Water held in Berlin from April to July. The general aspects of this have been discussed in the A. G. A. MONTHLY, and in several of the trade magazines, so that it is unnecessary to repeat that here, but there were several features of interest which deserve emphasis. The exhibit was a popular one designed to present the phases of the gas industry in an instructive and interesting manner, compelling even people entirely unfamiliar with gas and its uses to be absorbed in the breath-taking qualities of the wonders displayed. To do this most effectively, it was important to make the exhibits on a large scale, and this certainly was done. Single exhibitors thought nothing of taking 10,000 sq.ft. of space to put up full-size models of the equipment and actually operate it. For instance, in the utilization division, the exhibition management succeeded in putting into operation a full-size steam laundry, actually working and delivering goods to the entire neighborhood, as well as taking care of the extensive laundry requirements of the exhibition itself. All of this was, of course, on gas, and the gas appliances were prominently featured. Similarly the shops of the Berlin City Gas Company operated a branch doing tool hardening, forging, cutting, and other industrial gas operations. Several tailor shops and a small ceramic plant were all housed in the utilization hall. A gas bakery was the center of attraction not only because of the gas oven, but because of the very attractive cakes and cookies which they sold. A long line of women could always be found at the counters.

The greatest interest in the German show centered about the new hotel and restaurant equipment. In this field the Germans, with their love of good cooking and their fondness for eating in the restaurants, have made great strides forward. Hotel and res-

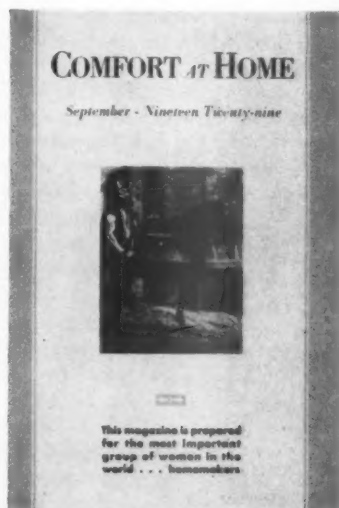
taurant equipment, in distinction perhaps to domestic equipment, is never finished in black iron, but is attractively decked out with enamel, nickel, and color.

Two items of special interest to the gas men attracted attention not only of the Germans, but of the many foreigners who visited the show. These included the new type of waterless holder construction eliminating the tar seal, heater and pumps, which has already been discussed in the July 13 issue of *Gas Age-Record*, and the new pressure regulators operating without springs or dead weights, and so designed that no vent connection to the outside is needed because rupture of the diaphragm automatically shuts off the entire gas flow.

Throughout Europe gas company efforts are hampered by the fact that so many of the companies are municipally owned. This in itself would not be a detriment, perhaps, but regrettably the municipalities feel that the gas sales are a splendid method of establishing an indirect form of taxation. As a result of this, the gas prices are relatively higher in Europe than they are in America. With the lower labor costs which are found in Europe, it should certainly be possible to sell gas at relatively lower costs than in America but, almost without exception, the gas costs are found to be considerably higher, especially when it is to be remembered that the customary calorific value of European gases is from 15 to 20 per cent below that of the manufactured gas in America. The municipalities, looking upon the gas companies as a source of revenue, are very slow to accept modernization of the gas rates. The municipal directors are not usually technically informed on the complicated problem of rates, and it is extremely difficult to urge the adoption of a three-part rate or anything approaching this in Europe. On the other hand, it is very often possible to make individual contracts with large consumers at favorable price levels, provided the community does not include communist directors on the board, because these invariably stand pat against any plan which will create a favored price for large consumers, even though such a move would

eventually benefit domestic consumers in even greater proportion. This difficulty has been especially noted in Paris.

It is worthy of special mention that the A. G. A. Testing Laboratory's success has been followed very closely in Europe, and within a short time the adoption of a good many of our principles will probably take place. Even at this time the London *Gas Journal* states, "Adoption of official certification of gas appliances is growing apace. In Denmark and the Netherlands a somewhat similar plan is in operation, and the New South Wales Commercial Gas Association have a central testing laboratory . . . Now the Canadian Gas Association have established a Laboratory Approval Division . . . The French industry is of opinion that official certification . . . encourages cooperation between the engineering and the appliance manufacturing branches." The German Gas Association has just adopted as the first step in their laboratory plan the requirements for approval of gas tubing based quite on the A. G. A. practice.



"Comfort at Home," the magazine for gas companies to send to a select list of domestic customers, is enjoying increased patronage since it has increased its size to 16 pages. This is a cover of a recent issue.

**Manufacturers Section**

H. LEIGH WHITELAW, Chairman

C. W. BERGHORN, Secretary

F. G. CURFMAN, Vice-Chairman

## Delegates Will Be Able to Visit Exhibits at A. G. A. Convention

THE American Gas Association and the member companies supporting it are naturally desirous that the members shall receive the maximum benefit from the Annual Convention and Exhibition to be held in Atlantic City, October 14-18, 1929.

On August 19 all members were advised that the Association had adopted a policy designed to enable delegates attending the convention and exhibition to obtain the maximum educational opportunities afforded by both. This policy involved curtailing the number of sectional meetings either by elimination of one afternoon meeting or, in the case of the Technical Section, reducing the time of three meetings by convening at 3:00 o'clock instead of 2:00 o'clock.

The cooperation of all is requested to the extent of instructing delegates who will attend the convention to visit the exhibits of the manufacturers on those afternoons when they will not be required to attend sectional meetings. The necessary information to give such instructions to delegates, is as follows:

### Accounting Section

There will be no meeting of the Accounting Section on Tuesday afternoon, Oct. 15. Every effort is being made by the managing committees and organizations of all sections to advise their members of the opportunity to visit the booths of manufacturers of equipment of particular interest to them. In the case of the Accounting Section members have been urged to visit the booths of manufacturers of office labor saving devices on Tuesday afternoon. The manufacturers have been urged on their part to be prepared for such visits and will have on exhibition a complete line of office labor saving device equipment and its direct application to the requirements of utilities.

### Commercial Section

There will be no afternoon meeting of the Commercial Section on Thursday, Oct. 17. Delegates having to do with the commercial activities are to attend the exhibits of manufacturers of utilization appliances on this afternoon.

### Industrial Gas Section

There will be no meeting of the Industrial Gas Section on Tuesday afternoon, Oct. 15. Delegates in attendance who are held responsible for a knowledge of the developments in appliances utilized for industrial purposes should attend the exhibits of such appliances on Tuesday afternoon.

### Technical Section

The sessions will convene on Tuesday, Wednesday, and Thursday afternoons at 3:00 P.M., instead of 2:00 P.M. Delegates who are interested in the production and distribution of gas and by-products are to use this additional hour on three afternoons in visiting the booths of manufacturers.

It should be noted, in addition to the above, that the Publicity and Advertising Section will have only one afternoon session—on Wednesday, Oct. 16. The Natural Gas Department will have only one afternoon session—on Tuesday, Oct. 15. While members of these two divisions will undoubtedly be interested in attending some of the other sectional meetings, they will be able to attend the exhibits in the relatively longer time available to them for this purpose.

In addition to the above, the Association has arranged for three large exhibits of an educational nature as follows:

1. The A. G. A. Exhibits, which will appear on the Auditorium Stage.
2. The Coke Exhibit, on the exhibition floor.
3. A Cooking Exhibit, which will also appear on the exhibition floor.

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## Research Will Show the Way

(Continued from page 597)

ordinate position or perhaps set aside entirely, but all will receive the earnest consideration and serious thought of a group of men in whom imagination, broad vision, and practical appreciation of the industry's aims and requirements are happily balanced. This committee will ultimately approve the allocation of each authorized project to that institution, laboratory, or body which is best suited to carry it to a successful conclusion. The complete undertaking may involve co-operative work with other industries; it may best be done independently or together with one of the technical schools or universities; or possibly it is of such a nature that the most appropriate place is in the Association's own laboratory at Cleveland, under the close scrutiny of the industry itself. The recommendations of the Committee on Coordination of Scientific and Marketing Research will cover all of these points when the proposal comes before the Executive Board, to which latter body is left the final approval and authorization of the necessary funds.

The project is now launched, supported by an adequate appropriation, but it is by no means left to guide itself. Systematic review of progress is required and rigorously maintained. The findings or results are periodically analyzed and are correlated, where possible and desirable, with other activities bearing upon or having any relation with the original subject. These reports are cleared through the headquarters staff, which not only makes them available to the industry but also interchanges them with other groups to whom they will be beneficial. It is to such supervision and follow-up that we owe much of the practical value of our research undertakings.

I have given you nothing more than an outline of the stages through which each individual project must pass before it becomes a part of our regular program. For further details I must refer you once more to the catalogue which, though not entirely up to date, will give you a more complete

picture than I have been able to draw of the comprehensive scope of this work.

It is natural to ask, "What is the significance of all this effort?" "What crisis, if any, does it apprehend?" We have prided ourselves in the past, and we may continue to derive satisfaction from the fact that the gas industry has gone ahead steadily year after year, extending its facilities and demonstrating its inherent stability in a consistent record of orderly progress and growth.

Why, then, this extraordinary concentration on the problem of research?

The answer, of course, is that no industry, however satisfactory its record of progress may have been, however sure it may feel as to the future, can afford to ignore the inevitable flux in conditions of living and buying habits that influence the public demand for its service or its product. You have heard much of these changes and their influence upon the use of gas for domestic purposes, particularly in urban communities.

The present spirit of the gas industry makes it alive to these trends. It knows, for example, that in a city like New York the service stations of life, as they have been called, now supply many of the requirements that were formerly provided in the home, even within the present generation; that the last seven years have seen an increase of 120 per cent in the number of tea rooms in New York, more than 100 per cent in the number of delicatessens, and 133 per cent in the number of commercial laundries. Purveyors to the living wants of the people have increased in number anywhere from three to seven times the rate of increase in population. When it is appreciated that these and related conditions are all reflected back to us, it becomes at once apparent why research work along marketing and utilization lines has become so necessary to our development.

Similar reasons—perhaps even of greater significance—may be found in the field of industry, wherein lies much of our greatest opportunity for future expansion. A year or so ago, the *Monthly Review* of the

(Continued on page 637)

## Industrial Gas Section

J. P. LEINROTH, Chairman

C. W. BERGHORN, Secretary

C. C. KRAUSSE, Vice-Chairman

## Industrial Gas Featured at Metal Show

THE National Metal Exposition, held in Cleveland, Ohio, during the week of September 9, in which the American Society for Steel Treating, the American Welding Society, the Institute of Metals, the Iron and Steel Division of the A.I.M.E., and the Iron and Steel Division of the A.S.M.E. participated, was a great success in attendance, exhibits, papers, and interest displayed.

The American Gas Association exhibit, covering a floor space of over 11,000 square feet, attracted very much attention. It was visited by men from all parts of the country, most of whom were interested, either directly or indirectly, in the use of industrial fuel. The high-grade modern furnaces and burner equipment displayed by the manufacturers who participated in the exhibit were a revelation to many visitors, some of whom had no idea that industrial gas furnaces had been developed to such a high degree of refinement and accuracy of control.

Representatives of the industrial fuel departments of many of the gas companies were present, and they saw to it that any con-

sumers or prospects of theirs, who attended the Convention, visited the A. G. A. exhibit.

The American Gas Association used a central location of 400 sq.ft., in which to display a model of the world's largest gas holder which revolved and displayed in its sides translucent photographs of actual industrial gas installations in the metal industries. This space was also set aside as a lounge from which were distributed technical publications. The rear wall of this central display was covered by a number of large size oil paintings depicting the use of gas for various metal melting and treating operations. The limits of the entire space were marked by corner posts on the face of which was displayed the seal of the American Gas Association. On the top of each of the corner posts was a luminous gas torch.

A new feature of the exhibit was the fact that every attendant on duty, whether in the American Gas Association booth, the East Ohio Gas Company booth, or in the booths of the respective manufacturers, wore a







white laundered coat. This made it possible for visitors to pick out an unoccupied attendant without any trouble and get speedy and complete information.

One of the features of the week was the importance of temperature and atmospheric control in forging furnaces which was brought out in a paper by W. E. Jominy, as a result of some of his work at the University of Michigan on the American Gas Association's research on forging. This paper was given on September 9 at the meeting of the American Society for Steel Treating. The data presented gave the limiting temperatures to which some of the more common forging steels may be heated without danger of harming the steel by overheating or burning.

Mr. Jominy's paper was well received and substantiated by other men carrying on research work of a similar nature. The enthusiastic reception by the listeners indicated their appreciation of the importance of his contribution.

The exhibitors operating with the American Gas Association were the American Gas Furnace Co., East Ohio Gas Co., Gehrich Oven Co., Eclipse Fuel Engineering Co., C. M. Kemp Mfg. Co., The Partlow Corp., The Selas Co., and the Surface Combustion Co. Their exhibits were very complete covering the latest type of gas-fired equipment.

The East Ohio Gas Company not only mailed invitations to all of their customers,

but in addition provided transportation and guides for them so that they could see the latest developments in industrial gas furnaces. These contacts were very worth while as apparently every customer engaged in the metal melting and treating industry was in attendance during the exhibition.

The Committee in charge of the American Gas Association booth consisted of: Karl Emmerling, H. F. Rehfeldt, E. B. Dunkak, C. W. Berghorn, and A. M. Apmann, Chairman.

The work of piping and setting of appliances was under the direct supervision of J. C. Shanks, of the East Ohio Gas Co., whose arrangements were complete in the last detail, and through whose careful efforts all the details were carried through without any hitch.

### Delegates and Exhibition

(Continued from page 629)

These are all educational in their nature and designed to supplement specific activities in the exhibit booths of the manufacturers. Members of the Commercial Section will be particularly interested in the cooking exhibit. Members of all sections will be interested in the A. G. A. exhibits. Members of the Technical Section will be particularly interested in the coke exhibit, especially those connected with companies not at present selling coke for domestic purposes. The executives will be particularly interested in all.

## Commercial Section

G. M. KARSHNER, Chairman

J. W. WEST, Jr., Secretary

G. E. WHITWELL, Vice-Chairman

## On Using Your Gas Company

By BERNARD J. MULLANEY

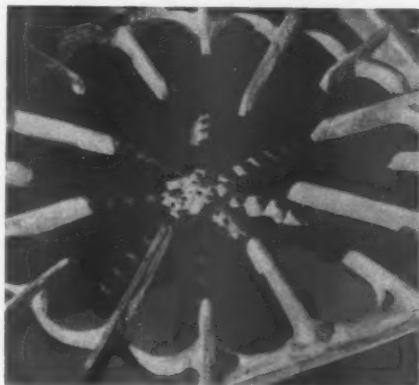
**I**F you play bridge, you doubtless utilize some of the opportunities offered, by publications or otherwise, to learn points of the game. In buying hats, gowns, shoes, hosiery, there is usually a saleswoman with whom you discuss style tendencies, suitability and other details. Practically every day you ask the grocer what fruits, vegetables, etc., are at their best. When you got your first car you

probably took lessons on how to drive it.

Do you make comparable use of your gas company? It is quite as well qualified and quite as ready as any of those others to help you make better use of the service in which it specializes, and which is such a vital detail in your home-making.

Perhaps you have had gas service so long that you regard it as "the same old story—nothing new." Or you may have subconscious impressions, derived from traditional prejudices, ancient quips, and smart-Aleck paragraphers, that your gas company's interest in you begins and ends with the monthly bill.

Either conclusion would be erroneous. There is constantly something new in gas service and much of the old is new to most users of the service. For it is a genuine service, not just a commodity called gas, that your gas company supplies. And its men and women are glad to tell you about it,



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Publication of this article in "Comfort at Home" signifies that Mr. Mullaney is directing his remarks to the user of gas. The points are so well brought out, however, that republication in the MONTHLY was deemed especially desirable.

and how to make better use of it, if given a hint of what you want to know.

Most gas companies go as far as they can in this telling, by means of letters, pamphlets, booklets, and otherwise, without waiting to be asked. You will find much of that distinctly useful, if you don't throw it away as "just advertising"; much about proper selection, care and use of the gas range and other appli-

ances; about oven temperatures for different cooking jobs and how to control them; about economical utensils and little wrinkles in the use of gas that add to the convenience, economy, and efficiency of it; about what gas will do for you in refrigeration, incineration, laundry work, and house heating; and, of course, about appliance-quality and prices, rates, bills, and other strictly business details. But your case may not be covered by this unless you specifically ask, by phone, by letter, or in person.

As for your gas company being interested only in getting some money from you every month—that is not reasonable when you analyze it. Your satisfaction with the service is the company's primary interest. And saying so is not just "guff"; it is only common sense.

Gas company managers know, as business men, that they can sell more gas by satisfying than by quarreling; that satisfied

customers are the best customers—easiest and cheapest to serve and, in the long run, most profitable. Hence, their desire to do all they can for your better satisfaction, whether it be giving helpful information and advice or adjusting kicks; for kicks come in every business.

But they are not mind-readers. You have to tell them what you want to know or want done, instead of just telling the neighbors. And when you make this use of your gas company you have at command an organization that specializes in the details of making gas service more useful to you, as doctors specialize in child feeding, eye troubles, or reducing diets.

### House Cooling

(Continued from page 592.)

electric refrigeration; *second*, research to determine the cost, limitations, and practical aspects of the cooling of residences and buildings in summer, and the volume, characteristics, and distribution of the load obtainable; and *third*, the development of efficient, reliable, and inexpensive appliances to do the work.

The first two investigations, if competently and energetically undertaken, will require a considerable expenditure but should be accomplished in a comparatively short time. If the results from the first two are encouraging, the carrying out of the third will require both money and a good deal of time.

There is no problem on which the need of reliable and accurate information is more important or urgent, and no subject more worthy of the expenditure of research funds by the Association on a scale that will insure a true answer to our question in the shortest time consistent with thoroughness.

If the industry fails to find the answer within a reasonable time, it will certainly be guilty of neglecting one of its greatest opportunities for expansion, advancement, and profit, and condemn itself to a period of ignorance and vacillation which cannot but prove costly and disastrous.

The American Gas Association is alive to the importance of gas refrigeration and

within the last year has made an appropriation of \$10,000, to be used in investigation and research on house cooling by gas. This is a decisive move in the right direction and should be pushed with all possible energy. It may be soon discovered that this amount is inadequate to the needs of the situation and further appropriation may be required. What is needed is a complete answer as to the cost of gas refrigeration and the commercial possibilities of cooling houses by gas, and this answer should be given in a comparatively short time. Delay means not only a loss of possible revenue from the sale of gas, but the difficulties that will be encountered if we enter the field late, after established competition from other sources of energy becomes entrenched.

### Facts of Utilization

(Continued from page 600)

fuel is without waste, labor is reduced to a minimum, and its use is revolutionizing several of our major industries.

The modern gas furnace is as different from the pile of bricks with a gas pipe of a few years ago as the modern automobile is from the ancient ox team. High fire resisting refractories and alloys together with substantial construction and adequate insulation have all contributed their part while yet another feature is that of recuperation.

Details of design can hardly be entered into in a summary of this nature, but a brief discussion of two may be of interest. In general it may be said that recuperation is of considerable value for working temperatures of 1500 deg. F and more, but hardly pays for itself at lower heats. The higher the temperature the greater the saving. On an enameling furnace operating at around 1700 deg. F., the gas saved by a recuperator, based on the consumption of the same furnace without a recuperator, was approximately 13 per cent, and this may be taken as a fair average for that condition. Corresponding tests on similar furnaces with and without automatic gas-air proportioning generally shows savings of from 10 to 30 per cent in favor of this equipment.

## Technical Section

HARRY E. BATES, Chairman

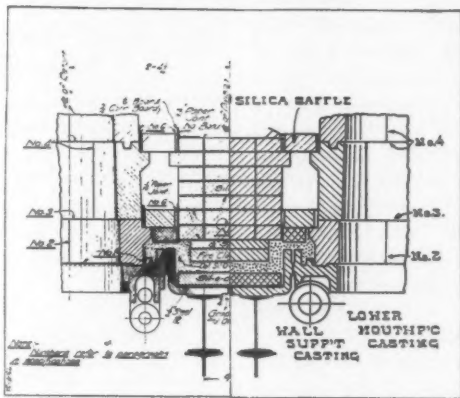
H. W. HARTMAN, Secretary

B. V. PFEIFFER, Vice-Chairman

## How to Prepare Copy for Lantern Slides

By ARTHUR KNAPP

SINCE lantern slides are used almost universally as aids in the presentation of technical papers, it is important that the same degree of thought and care shall be given to the preparation of lantern slide copy that is given to the preparation of the text of the paper.



This illustration shows that simplification is necessary when copy is prepared for lantern slides

## Dimensions

Lantern slides are  $3\frac{1}{4}$ " vertically and 4" horizontally. The size of the image on the slide is usually not larger than  $2\frac{5}{8}$ " x  $3\frac{1}{4}$ ", due to the border mat and binding necessary in the finished slide. Finished copy for slides must, therefore, have a ratio of width to height of approximately 1 to .8, if full use is to be made of the slide area.

Lantern slides cannot be projected with the longer dimension vertical.

## Visibility

The entire success of the presentation of any subject by means of lantern slide projections hinges upon the visibility of the projection to the audience. Since it is desirable that the subject be visible to the entire audience, the problem must be solved for the maximum audience distance which may be expected.

Visibility is a function of several variables, of which the most important are color and brightness contrast and the resolving power

of the eye. In the case of lantern slide projections, the resolving power of the eye is the only variable which requires careful consideration, since black lines on a white background give almost maximum color and brightness contrast.

The threshold of the resolving

power of the eye is equivalent to about one-half minute of arc. This means that the eye just begins to distinguish a single black line on a white background as a straight, unbroken, black line when the ratio of the width of the line to the distance from the eye is the tangent of one-half minute or .00015. This gives us a guide for the dimensions of lines and lettering which are to appear on the screen.

The minimum of good visibility is about twice this ratio or .0003.

## Formula for Width of Lines

The following formula may be used to determine the minimum width of line which should be used on lantern slide copy:

$$m = .0003 A \frac{c}{P}$$

$m$  = Minimum width of line in inches.

$A$  = Maximum audience distance in feet.

$c$  = Width of copy in inches.

$P$  = Width of projection on the screen, in feet.

(Usually about 80 per cent of the width of the screen.)

A maximum audience distance of 50 feet and a projection width of six feet may be

Mr. Knapp is with the purchasing department of The United Gas Improvement Co., Philadelphia, Pa.

assumed for the average small lecture rooms of hotels, clubs, and technical societies. A maximum audience distance of 100 feet and a projection width of ten feet may be assumed for the average auditorium in which technical meetings are held.

#### Lettering

The visibility of parallel lines which are close together is approximately half that of a single line. This determines the size of letters since they are composed essentially of parallel lines.

The minimum letter to be used on any lantern slide copy should be of a height which is ten times the thickness of the minimum line and should be drawn with lines twice as thick as the minimum line as derived by the formula given above.

#### Legibility

Legibility in lantern slide projections is a function of the contrast of the essential parts of drawings or charts. In order that the audience may read the drawings or charts easily and quickly, it is necessary to have well-defined contrast between the essential and non-essential lines.

#### Simplicity

Lantern slide projections may fill all the requirements of visibility and legibility and still not be satisfactory unless the subject is presented in its simplest form. Each slide should be prepared to show but one subject, and all details not essential to the subject should be omitted.

Working drawings seldom make good lantern slide copy. Typewritten impressions are very unsatisfactory and should never be used in lettering drawings or charts. The copy prepared for cuts may not do for lantern slide copy unless they meet all the requirements noted above.

The approximate quality of any copy may be judged by holding it at a distance from the eye, such that:

$e$  (distance from eye) =

$$\frac{c \text{ (width of copy)} \Lambda \text{ (max. audience dist.)}}{P \text{ (width of projection, feet)}}$$

Usually lantern slide copy is made too large. Any subject which cannot be drawn on a sheet 12 inches wide by 10 inches high can seldom be projected satisfactorily. The labor involved in drawing the proper size of letters becomes prohibitive with large-sized copy.

### Fort Worth Company Now in Its New Building

WITH a formal opening and housewarming just over, the Fort Worth, Texas, Gas Co. has settled down to anticipate winter loads in its new four-storied building, said to be the best-equipped gas utility structure in the Southwest.

Indiana limestone with a black granite trim has been used on the front of the building; the other three sides are of a grayish-white brick. A feature of the main floor is the decorative tile used in the wainscoting and imported from Valencia, Spain.

Commercial offices are situated on the first floor. A parking space has been set aside for customers' use, and ample room has been arranged to care for appliance display. Executive offices are provided for on the second floor and the third floor is devoted to the operating departments. A single room occupies the fourth floor. It is equipped with a stage about 12 by 25 feet and is to be used for cooking schools, appliance demonstrations, employees' club room, etc.

### Research and Statistics

(Continued from page 626)

failure to maintain or even of over-attainment of established standards, either these standards fail to recognize specific conditions, and are in themselves at fault, or emergencies have rendered the comparison valueless, or the bars of control have weakened and waste has crept in. And in every case analysis and research must point out ways to simplify the course of authority, must relate the cause of failure to the effect, and can alone fix the responsibility.

Figures alone mean nothing—and the analysis of them, if not completely informed and as nearly correct as possible, may be worse than nothing. Research, in its interpretation of the past as an index to and measurement of the future, is an established and essential factor in modern business.



## Research Will Show the Way

(Continued from page 630)

United States Bureau of Labor said, "We are at the present time experiencing the most remarkable advance in productive efficiency in the history of the modern industrial system."

Our future development in the use of gas for industrial operations must be attuned to the most exacting requirements of this "productive efficiency."

It becomes necessary for us, therefore, to assure ourselves of constant improvement in the efficiency with which gas fuel also is used, and the extensive research activities now under way in the field of industrial gas have such improvement as well as the application of gas to new uses in industry as their objectives.

Here again the correct measurement and appraisal of the exact facts of the past and present afford the truest index to future developments.

I cannot leave this subject without at least a momentary consideration—far less than it deserves—of the influence, definite and inescapable, of the rates charged for gas service upon the total volume of sales. This influence is an established and incontrovertible fact, all contrary theories notwithstanding. Basically our industry requires larger sales per dollar of investment and a much more rapid turnover. We can have no more convincing proof of that than is afforded in the natural gas business, where we often find the average revenue per customer approximately twice that of manufactured gas. Unquestionably the lower rates encourage much broader use of the product.

While some load curves at present simulate the contours of a scenic railway, the development of off-peak volume through inductive seasonal rates as well as the development of new applications of gas having the special characteristics of off-peak utilization are coming within the range of practical accomplishment; and serious consideration is now being given to the possibility of employing periodically idle plant facilities for useful purposes other than and

possibly quite remote from those for which they were originally intended. Suggestions for the complete working up and marketing of chemicals derived from the by-products of carbonization and purification or even the operation of gas-making facilities to supplement the resources of other manufacturing enterprises are but typical illustrations of the extent to which the conservative attitude of the past has been discarded in favor of a broader view.

What I have tried to say in this brief review constitutes the basis of my own faith in the future of the gas industry—a faith that I find supported by the opinions expressed, sometimes privately and sometimes publicly, by men of national prominence having large financial interests in the electrical industry, transportation, and other great enterprises as well as in our own.

The progress of the gas industry has been steady and sure, rather than spectacular. Nevertheless, in recent years there has been a growing inclination to depart from beaten paths, to loosen the reins on the spirit of adventure and give it more play. This does not mean that we are anticipating revolutionary discoveries or near-miracles, although the stamp of ultra-conservatism is sure to mark him who disputes the possibility of anything in an age when *It can't be done* is answered by *We've done it*.

In some directions, as I have said, we are working along lines that have their visionary aspects, but the goal of practical accomplishment stands before them all. Our best assurance of genuine progress lies in the fact that all branches of the gas industry are working earnestly together, as we have seen, by means of a well-designed framework or plan that has been shaped and energized by the most capable men in the field, and that this program has for its objective, within the bounds of early realization, a wider range of public service and a stable and balanced prosperity in every section and department of our business. To those ends I believe we shall ultimately attain.

This faith is supported, besides the tangible prospects that I have referred to, by the spirit in which those of our calling are

devoting themselves, their thoughts and their unselfish labors to the advancement of the common cause. I know of no industry more closely integrated than our own nor one that is working more effectively along practical lines for the progress and prosperity of the whole.

Some months ago I had occasion to quote the significant statement of a distinguished gentleman entirely outside our field, but who had achieved wide prominence because of his interest in and broad knowledge of industrial and financial affairs. This seems another fitting occasion to repeat the view of one not of our business, expressed in these words of the late Samuel Rea, one time President of the Pennsylvania Railroad, who, on the occasion of the 50th Anniversary of the Engineers' Club of Philadelphia last year, said in the course of an impressive address:

"The gas business as a public utility will supply practically all heat distributed in urban localities. As capital cheapens, it will become possible to construct distributing systems furnishing cheaply produced gas for house heating as well as cooking. Industries, in many cases, will similarly be supplied with gas for fuel instead of burning coal in individual furnaces and under boilers. We may then realize the smokeless city, and added sunlight will greatly improve the health of urban dwellers."

I know that I voice the profound conviction of those who are in close touch with the development of the gas industry when I say that we believe all of this will come to pass, and more.

### Marking Holders

(Continued from page 590)

representing the American Gas Association in the national survey in this particular field.

By the first of the year it is expected that the report of the Insull Committee will be ready for presentation to the organized gas industry. In the meantime, it may be anticipated that Pacific Coast companies will show a larger participation in the work of encouraging aviation than any other section of the country. If this should prove to be the case it would be entirely in keeping with

the spirit of the West. Here aviation is making its most rapid development and it is here that flying is giving the most in service along the entire Pacific seaboard.

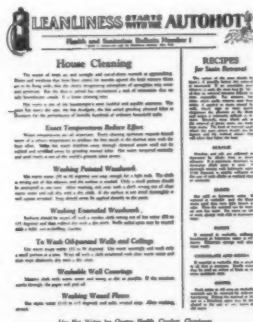
Airplane travel is here to stay. It is growing faster than any other industrial activity in America. Conditions favoring that growth are more prevalent on the Pacific Coast than in any other section of the United States. In the gas industry, Pacific Coast companies are recognized for their progressiveness and for their willingness to cooperate in every way with the communities which they serve.

The use of gas for cooking, for heating, for refrigeration, for water heating, and for thousands of uses as an industrial fuel, is as modern as present-day aviation. The communities which we serve are quick to appreciate an identifying mark for their home town visible from the air.

Colonel Charles A. Lindbergh—probably the best public relations man in America today—asks us to assist in this way, in the development in aviation. Gas company executives soon will be using planes with as little thought and as little concern as they now use automobiles. In marking our holders and other properties with appropriate airway signs we are in step with this modern age.

### Cedar Rapids Co. Publishes Cleanliness Leaflet

THE Cedar Rapids Gas Company, Cedar Rapids, Iowa, is now publishing a two-page leaflet devoted to health and sanitation. The title of this interesting publication, which is for the gas customer, is "Cleanliness Starts with the Autohot."



Use the Vapor for Cleaner Bath, Kitchen, Closets

## Associations Affiliated with A. G. A.

### Canadian Gas Association

Pres.—Kenneth L. Dawson, Nova Scotia Light & Power Co., Ltd., Halifax, N. S.  
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.  
Conv., 1930.

### Colorado Utilities Association

Pres.—H. S. Robertson, Denver Tramway Corp., Denver, Colo.  
Sec.-Tr.—O. A. Weller, Public Service Co. of Colo., Denver, Colo.  
Conv., 1930.

### Empire State Gas and Electric Association

Pres.—William J. Welsh, New York & Richmond Gas Co., Staten Island, New York.  
Chairman Gas Section—R. Van Vliet, New York & Richmond Gas Co., Staten Island, N. Y.  
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.  
Conv., 1930.

### Illinois Gas Association

Pres.—E. E. Lungren, Western United Gas & Electric Co., Aurora, Ill.  
Sec.-Tr.—George Schwanner, 305 Illinois Mine Workers Bldg., Springfield, Ill.  
Conv., 1930.

### Indiana Gas Association

Pres.—C. L. Kirk, Citizens Gas Co., Indianapolis, Ind.  
Sec.-Tr.—F. W. Budd, Central Indiana Gas Co., Muncie, Ind.  
Conv., 1930.

### Michigan Gas Association

Pres.—A. I. Snyder, Detroit City Gas Co., Detroit, Mich.  
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.  
Conv., 1930.

### Mid-West Gas Association

Pres.—E. H. Vierregg, Central Power Co., Grand Island, Nebr.  
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.  
Conv., Waterloo, Iowa, Apr. 14-16, 1930.

### Missouri Association of Public Utilities

Pres.—T. J. Strickler, Kansas City Gas Co., Kansas City, Mo.  
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.  
Conv., 1930.

### New England Gas Association

Pres.—J. J. Quinn, Boston Consolidated Gas Co., Quincy, Mass.  
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.  
Chairman Operating Div.—Isaac T. Haddock, Cambridge Gas Light Co., Cambridge, Mass.  
Secretary Operating Div.—H. G. Taylor, Lawrence Gas & Electric Co., Lawrence, Mass.  
Chairman Sales Div.—J. H. Sumner, Cambridge Gas Light Co., Cambridge, Mass.  
Sec.-Tr. Sales Div.—A. M. Slattery, Hoffman Heater Co., Boston, Mass.  
Chairman Industrial Div.—L. B. Crossman, Boston Consolidated Gas Co., Boston, Mass.  
Sec.-Tr. Industrial Div.—Chas. H. O'Donnell, Boston Consolidated Gas Co., Boston, Mass.  
Chairman Acctg. Div.—R. D. Washburn, Massachusetts Lighting Co., Boston, Mass.  
Sec.-Treas. Acctg. Div.—Otto Price, Boston Consolidated Gas Co., Boston, Mass.

Chairman Manufacturer Div.—T. H. Piser, Welsbach Co., Boston, Mass.  
Sec.-Treas. Manufacturers Div.—J. H. McPherson, 250 Stuart St., Boston, Mass.  
Conv., 1930.

### New Jersey Gas Association

Pres.—R. A. Koehler, Public Service Electric & Gas Co., Newark, N. J.  
Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.  
Conv., 1930.

### Ohio Gas and Oil Men's Association

Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.  
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.  
Conv., 1930.

### Oklahoma Utilities Association

Pres.—T. R. Weymouth, Oklahoma Natural Gas Corp., Tulsa, Okla.  
Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.  
Conv., 1930.

### Pacific Coast Gas Association

Pres.—F. H. Bivens, Southern Counties Gas Co., Los Angeles, Calif.  
Exec. Sec.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.  
Conv., 1930.

### Pennsylvania Gas Association

Pres.—W. A. Norris, Lebanon Valley Gas Co., Lebanon, Pa.  
Sec.-Tr.—Frank W. Lesley, Pennsylvania Gas & Electric Co., York, Pa.  
Conv., 1930.

### Pennsylvania Natural Gas Men's Association

Pres.—George E. Whitwell, Equitable Gas Co., Pittsburgh, Pa.  
Sec.-Tr.—B. H. Smyers, Jr., Philadelphia Co., Pittsburgh, Pa.  
Conv., 1930.

### Southern Gas Association

Pres.—D. H. Levan, Savannah Gas Co., Savannah, Ga.  
Sec.-Tr.—G. H. Schlatter, Birmingham Gas Co., Birmingham, Ala.  
Conv., 1930.

### Southwestern Public Service Association

Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.  
Chairman Gas Section—Frank L. Chase, Lone Star Gas Co., Dallas, Texas.  
Sec.—E. N. Willis, 403 Slaughter Bldg., Dallas, Texas.  
No Convention, 1929.

### The Public Utilities Association of Virginia

Pres.—A. W. Higgins, Virginia Public Service Co., Charlottesville, Va.  
Sec.—A. B. Tunis, 301 East Grace St., Richmond, Va.  
Conv., Nov. 21 & 22, 1929, Chamberlin-Vanderbilt Hotel, Old Point Comfort, Va.

### Wisconsin Utilities Association

Pres.—G. W. Van Derzee, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.  
Exec. Sec.—J. N. Cadby, 105 Wells St., Milwaukee, Wis.  
Meetings of Sections.

<p><b>Eleventh Annual Convention of the American Gas Association</b>  <b>Atlantic City, N. J.</b></p> <p><b>October 14-18, 1929</b></p>
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# Employment Bureau

## (Address All Communications to Key Number)

### SERVICES REQUIRED

**COMMERCIAL GAS ENGINEER** required. Familiar large gas installations and appliances and capable supervising meter shop. Location, South America. Applicants should give full particulars, education, experience. References. Address A. G. A.

Key No. 0148.

**WANTED**—Young college graduates of mechanical or chemical engineering. Positions permanent. Good opportunity for advancement. Address A. G. A.

Key No. 0150.

**WANTED**—Natural Gas Engineer and Executive. Must have practical experience in construction of main line and distributing systems, ability to make gas sales and purchases, and thorough knowledge of general executive work. Give full details of previous employment, number of years, and salary desired. Address A. G. A.

Key No. 0152.

**WANTED**—Two high-grade first-class salesmen to sell appliances in divisions of public utility in South. Work in progressive cities. Salary and commission. Address A. G. A.

Key No. 0153.

**HOUSE HEATING SALESMEN**—Eastern Utility has vacancy for two men between 25 and 40 years of age for sales work in Gas House Heating. A thorough knowledge of heating and a successful sales record are essential. Permanent position with good opportunity. Please give age, education, experience, and salary desired. Replies will be considered as confidential. Address A. G. A.

Key No. 0154.

**OLD ESTABLISHED MANUFACTURER** of small gas appliance accessories located in the Middle West has opening for man with creative or inventive ability for the design and development of new devices. State age, education, experience and salary desired in first letter. Address A. G. A.

Key No. 0155.

**LARGE EASTERN UTILITY** (New York State)—desires a few recent technical graduates to specialize in gas engineering. Applicants should give full particulars as to education, experience, references, etc. Address A. G. A.

Key No. 0156.

**WANTED**—Several Distribution Engineers, Natural Gas experience desirable but not essential. State experience and salary expected. Address A. G. A.

Key No. 0157.

**SALES ENGINEERS**—Wanted by large public utility in the Middle-West. Experienced in commercial and residential heating. Must be a high school graduate. College graduate from an engineering course preferred. Permanent position. Please state age, experience, education and salary expected. Address A. G. A.

Key No. 0158.

**POSITION WANTED**—Meter Foreman desires position with gas company. Experienced in all makes of meters. Best of references to character and ability. Address A. G. A.

Key No. 305.

**GAS ENGINEER**, college education, six years' experience in gas distribution, both H.P. M.P. and low pressure, and water-gas manufacturing from 3,000 M per day plant to 15,000 M per day plant, and general gas company construction, desires engineering position as manager, assistant manager, or superintendent. Address A. G. A.

Key No. 306.

**EXECUTIVE**, able to qualify as manager would like to make change. Address A. G. A.

Key No. 307.

### SERVICES OFFERED

**GAS ENGINEER**, 45, experienced. Coal and Water Gas Sets, as manager for fair sized plant. Good executive. Address A. G. A.

Key No. 290.

**YOUNG LADY** with twelve years' experience in coke oven and gas business, desires secretarial position, New York City preferred. Address A. G. A.

Key No. 291.

**ADVERTISING MAN**, experienced in trade paper, newspaper, direct mail and other forms of advertising, available. Now employed as advertising manager by large public utility. Capable of organizing and directing an advertising department or handling the work unassisted. Age 30, married. Protestant. No objection to location. Address A. G. A.

Key No. 292.

**AVAILABLE**, a man who has been employed through a continuous period of years in nearly all branches of the gas business. General office to superintendent of manufacture and distribution, including both coal and water gas. Would like to make a similar connection or one of general supervision. Address A. G. A.

Key No. 293.

**POSITION WANTED**—Technical man now employed desires new location. Eight years' experience in distribution and transmission of natural and manufactured gas. Is able to organize and direct large crews. Also experienced in leakage surveys and appraisal work. Address A. C. A.

Key No. 294.

**TECHNICAL GRADUATE**, twenty years' experience in manufacture of water gas. Age 45, married. Open for position as manager or superintendent. Address A. G. A.

Key No. 295.

**WANTED**—Position as assistant to engineer of distribution by young man with four and one-half years' experience in Distribution Department of large corporation. 22 years old. Single. Willing to travel. Good references. Address A. G. A.

Key No. 296.

**CERTIFIED Public Accountant** (N. Y.) five years' gas and electric rate case and accounting experience, university graduate, age 30, immediately available. Address A. G. A.

Key No. 298.

**A TECHNICALLY EDUCATED GAS ENGINEER**, now employed, with 15 years' experience in Coal and Water Gas Operation, Distribution and Industrial Sales, desires new connection. Address A. G. A.

Key No. 299.

**PUBLIC RELATIONS DIRECTOR**—The State House and political reporter for one of the large New England newspapers desires connection with a public utility or manufacturing enterprise where his wide experience in publicity, house organs, statistics, business research, governmental and economic conditions will be of value. Ten years all branches newspaper work. Massachusetts Tech and Columbia. Age 29 and married. Has handled many public utility cases and other important newspaper assignments. Excellent recommendation. Address A. G. A.

Key No. 300.

**EXPERIENCED APPLIANCE SALESMAN**—Man with several years experience selling best known lines of gas heating appliances. Would consider similar position or direction of merchandising department some growing gas utility. Texas, Oklahoma or Kansas preferred, but will go anywhere opportunity offers. Address A. G. A.

Key No. 301.

**ENGINEER**, technically educated, with wide experience in steam engineering, operation and five years Superintendent of Customer's Service Department of a large gas company. Desires connection preferably where both experiences can be used to advantage. Address A. G. A.

Key No. 302.

**AVAILABLE**, New Business and Commercial Manager. Age 30, married. Has successful record merchandising gas appliances, house heating, etc., with Public Utility. Desires position in Commercial Field. Technical education and familiar with Engineering problems and Office routine. Good executive. Address A. G. A.

Key No. 303.

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# Attention

## Meter Men

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